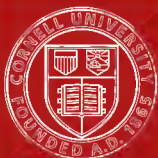


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THE
BUILDING OF A BRAIN.

BY
EDWARD H. CLARKE, M.D.,
AUTHOR OF "SEX ^{IN} EDUCATION."



BOSTON:
JAMES R. OSGOOD AND COMPANY,
(LATE TICKNOR & FIELDS, AND FIELDS, OSGOOD, & Co.)

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“Naturam expellas furca, tamen usque recurret,
Et mala perrumpet furtim fastidia Victrix.”

HORATIUS, *Ep.* I., x.

“What is the Light of Nature in Man, but that Order which the most Glorious Former of all things hath set (like Wheelles in Clocks or Watches) a going in all his Creatures?

“Some have observed that in the Insensible Creatures to which the most High hath only given Beings, that there may be observed a Male and Female amongst them.

“This is more observable in Vegetables or growing Creatures, as in Plants, Trees, Herbs, Flowers, &c.

“More yet in Sensitives, as Birds, Beasts, Fishes.

“Most of all in Rationals: Men and Women, whom the most High hath so wonderfully distinguished.

“It is true, that in Religious and Christian Matters there is no respect of persons with God, as of Man before the Woman: otherwise than to order Natural and Civil.

“The Woman is Predestinated, is Called, is Justified, is Glorified, and wears that Golden Chain as well as the Wisest and Strongest of Mankind.” — ROGER WILLIAMS: *George Fox Digg'd out of his Burrowes*, Boston 1676 Appendix p. 25.

“Warum war die Jugenderziehung der Griechen eine so erfolgreiche? Weil sie auf die physische Erziehung dieselbe Aufmerksamkeit richtete, als auf die geistige.” — DR. HERMAN KLENCKE: *Schul-Diätetik*.

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PREFACE.

THE exciting cause, to use a medical phrase, of the appearance of the present essay, may be inferred from the following correspondence:—

PEORIA, ILLINOIS, April 25, 1874.

EDWARD H. CLARKE, M.D.

Dear Sir,—The Executive Committee of the National Educational Association invite you to prepare for the next session of the Association a paper on the subject of the “Education of Girls.” This invitation may be considered as not coming from the committee only, but from several of the educational men and women of the country, who have suggested that the question would be a profitable one for consideration at that time.

The widespread comment which your book has created, and the numerous replies it has elicited, will insure you the best attention of the Association. I trust that you will consider the invitation of the committee favorably, and be able to give an affirmative reply.

I remain truly yours,

S. H. WHITE,

Chairman Ex. Com. Nat. Ed. Asso.

BOSTON, May 5, 1874.

S. H. WHITE, Esq.,

Chairman Ex. Com. Nat. Ed. Association.

Dear Sir, — Your favor of last month, inviting me, in behalf of the Executive Committee of the National Educational Association, to prepare a paper for the next session of the Association on the subject of the "Education of Girls," was received about a week ago. My reply has been delayed till the present time in order to give the matter my most serious consideration.

When I published my essay upon "Sex in Education," it was my intention not to publish any thing more upon that subject, but to leave it for educators to discuss, if they considered it worthy of their discussion. Your invitation has obliged me to reconsider that decision. Personally I should prefer to remain silent, and let the seed that has been sown germinate and grow without my interference. On the other hand, I am not insensible to the obligation which rests upon every one to render whatever service he can, however little, to any good cause that is brought to his notice. I therefore accept the invitation which you have extended, and remain

Very truly yours,

EDW. H. CLARKE.

Shortly before leaving Boston for the meeting of the Association at Detroit, the author was informed

that half an hour was the time allotted for the delivery of his address. In consequence of this limitation, only a portion of it was imposed upon the Association. He has ventured, however, to offer the whole paper, with additions, to the public in its present form. The first part contains the address as originally prepared: the second and third parts exhibit facts and statements, derived from various sources, which are not only intimately connected with the subject of the address, but indicate and illustrate the error in our American system of female education that has recently been so largely discussed.

Should the reader find the following pages too long for his leisure, or too dull for his thought, he has an easy remedy in his own hands; and however soon they drop away from the eye, and out of the thought of the public, the author will still hope that the discussion which has been started, and the investigations which have been undertaken, concerning the relation of sex to education, will continue, till Nature's fundamental distinctions are practically and permanently recognized in and out of school. Then one great difficulty in the way of solving the "woman question" will be removed, and more rapid progress in human development be made possible.

NATURE'S WORKING-PLANS.

THE BUILDING OF A BRAIN.

PART I.

NATURE'S WORKING-PLANS.

“The entire bodily system, though in varying degrees, is in intimate alliance with mental functions. To confine our study to the nervous substance would be to misrepresent the connection; and the knowledge of that substance, however complete, would not suffice for the solution of the problem.” — ALEXANDER BAIN, LL.D.: *Mind and Body*, p. 4.

No race of human kind has yet obtained a permanent foothold upon this continent. The Asiatics trace back their life in Asia so far, that the distance between to-day and their recorded starting-point seems like a geologic epoch. The descendants of the Ptolemys still cultivate the banks of the Nile. The race that peopled Northern Europe when Greece and Rome were young, not only retains its ancient place and power, but makes

itself felt and heard throughout the world. On this continent, races have been born and lived and disappeared. Mounds at the West, vestiges in Florida, and traces elsewhere, proclaim at least two extinct races. The causes of their disappearance are undiscovered. We only know that they are gone. The Indian, whom our ancestors confronted, was losing his hold on the continent when "The Mayflower" anchored in Plymouth Bay, and is now also rapidly disappearing. It remains to be seen if the Anglo-Saxon race, which has ventured upon a continent that has proved the tomb of antecedent races, can be more fortunate than they in maintaining a permanent grasp upon this Western world. One thing, at least, is sure, — it will fail, as previous races have failed, unless it can produce a physique and a brain capable of meeting successfully the demands that our climate and civilization make upon it. But the Anglo-Saxon will not be satisfied, and ought not to be, with simply securing a permanent foothold here.

He will not rest content with mere acclimation and existence. The sponge and the oyster can exist, and perpetuate their kind. He must do more than they: he must ascend in the scale of being, as well as exist.

Two duties, then, are imposed upon our civilization. Two problems are presented to our educators. The duties are, first, to secure the perpetuation of the race in America; and, secondly, to provide also for the survival of the fittest here. The problems are, first, to develop the individual to the highest degree; and, secondly, to obtain this development without interfering with the perpetuation of the best. In other words, humanity demands, and our education must give, both the highest development of the individual, and the perpetuation of individuals thus developed, or, as it is commonly expressed, the perpetuation of the fittest. It has been argued, with much apparent force, that these two results are impossible, because the highest cerebral development, being made at the expense of

the rest of the organization, sterilizes the individuals whose brains attain such supposed magnificent proportion and quality. This is not the place, nor does it fall within the scope of this paper, to point out the fallacy of such a statement. It is referred to only for the purpose of calling attention to a physiological error that has already been grafted into our system of education, and which exerts its most pernicious influence in our common and high schools; viz., the error of exclusively developing one part of the organization at the expense of and by ignoring the rest. Every physiologist knows that one-sided development is possible, and may be artificially attained. The athlete may develop his muscle, the glutton his stomach, and the sensualist his power, at the expense of the brain; and, conversely, the brain may be developed at the expense of muscle, stomach, and reproductive force; and this inharmonious growth may be carried so far, by dwarfing more or less of the organization, as to produce what physiology

calls monstrous brains, stomachs, muscles, and the like, — that is, monstrosities, which, by a beneficent law of Nature, cannot perpetuate themselves.*

How much the literature, politics, and morals of the world may have suffered from the abnormal intro-cranial development of some, who, like Byron, Napoleon, and Loyola, have compelled the world's attention,

* "Not only are the energies of the Esquimaux expended mainly in defending himself against loss of heat, and in laying up stores by which he may continue to do this during the arctic night, but his physiological processes are greatly modified to the same end. Without fuel, and, indeed, unable to burn within his snow hut any thing more than an oil-lamp, lest the walls should melt, he has to keep up that bodily warmth which even his thick fur dress fails to retain, by devouring vast quantities of blubber and oil; and his digestive system, heavily taxed in providing the wherewith to meet excessive loss by radiation, supplies less *material for other vital purposes*. This great physiological cost of individual life, indirectly checking the multiplication of individuals, arrests social evolution" (HERBERT SPENCER: *Climate and Social Development*, in *Popular Science Monthly*, July, 1874, p. 322.) The distinguished author illustrates the same law by the development of the Fuegians.

we may guess, but can never know. Shakspeare's brain probably crowned a nervous system and a body that presented very little inharmonious growth. Doubtless the same may be said of Mary Somerville.

Brains rule the world and the individual. The problem of the age which educators are to solve, with all the light that experience, aided by physiology and reflection, can give, is, how to build the best brains out of the materials given to work with. The demand of humanity is, Give me the best possible brain for men and women both. Fortunately, the necessity of answering this demand admits of no dispute. The best possible brain is as much a necessity for one sex as for the other. Indeed, such is the divine alliance between the sexes, that it is impossible to produce the best possible brain for one sex, unless you produce the best possible brain for the other also. This constitution of human nature — the interdependence of the sexes, by which the advance of one is contingent upon the advance of the other,

the best development of the masculine and feminine brain made to wait on each other, which together can unlock the secrets of the universe — is admirably expressed by Emerson, in language that is as full of physiological truth as of poetic beauty: —

“From the twins is nothing hidden;
To the pair is naught forbidden;
Hand in hand the comrades go
Every nook of Nature through;
Each for other they were born,
Each can other best adorn.”

Unless men and women both have normally-developed brains, the nation will go down. As good a brain is needed to govern a household as to command a ship; to guide a family aright as to guide a Congress aright; to do the least and the greatest of woman's work as to do the least and the greatest of man's work. Moreover, in both sexes, the brain is the conservator of strength and prolonger of life. It is not only the organ of intellection, volition, and spiritual power; but the force evolved from it, more

than the force evolved from any other organ, enables men and women to bear the burdens, and perform the duties, of life ; and with its aid, better than with any surgery, can they overcome the "ills that flesh is heir to."

But the organs whose normal growth and evolution lead up to the brain are not the same in men and women : consequently their brains, though alike in microscopic structure, have infused into them different, though equally excellent qualities. If it were not so, Emerson's lines would be absurd, sex would be a myth, men and women would be identical ; and it would be folly to discuss the relation of sex to education.

Poor brains, automatic ganglia, will grow, like weeds, without cultivation, on any soil. The best brains, the only sort the world needs, are built by education, or educated evolution, in accordance with working-plans that Nature furnishes. Let us endeavor, then, to get some notion, however crude, of the way in which the divine Architect, whom

we know as Nature's God, builds a human brain. By so doing we shall clear the way to a correct understanding of the true relation of sex to education.

The building of a brain: this is to-day's social problem; and teachers are largely charged with its solution. When this is solved, all other problems will be easily disposed of; for a human brain is the last, the highest, "the consummate flower" of Nature's development on this planet. It cannot be made, except as the crown of the rest of the body, and, to a large extent, out of the rest of the body. No perfect brain ever crowns an imperfectly developed body. When Michael Angelo reared St. Peter's dome in the air, he made every stone beneath contribute not only to the use and beauty of the part he put it in, but to the support and power of the dome. The brain must be built up in connection with the building of the rest of the body, remembering constantly that the imperfections of the latter reflect themselves upon the former.

In one sense, the process of brain-building is alike for the two sexes ; in another sense, it is different. It is the same for both, inasmuch as the process which evolves the best possible brain, by means of appropriate brain-exercise, including cerebration, out of the underlying organization, is alike in the two sexes.

It is different for the two, in so far as there are any organs, or sets of organs, in the structure of one sex that are not in the structure of the other. Provided the organization of both sexes is normal, and all their functions normally performed, the same sort of brain-work will develop the brain of each. But if the methods of education render abnormal any part of the body, or interfere with any function, there will not only be damage to the part disturbed, and friction in its function, but the brain will suffer just in proportion to the importance of the organs disturbed, and the amount of the disturbance.

It will avoid confusion, and, perhaps, prevent misconception, if, before proceeding

farther in this discussion, the meaning is clearly defined in which some of the terms employed in it are used.

First, brain is used as the correlative of mind, not from a materialistic point of view, as if mind (including volition) and brain were identical, but because we know, and only can know, the mind through the brain. The quantity and quality of the latter determine for us the quantity and quality of the former. The development of the soul and mind — of the *ego* — resolves itself into the development of the brain. The artist who builds a fountain looks carefully after the strength and structure, the quality and form, of what he builds, and troubles himself very little about the water which is to animate his work. He knows that jet and drop and spray will pour out just as the fountain permits the flow. So with the brain. In proportion to the character of its structure will be the manifestation of mind and spirit through it. Build the brain aright, and the Divine Spirit will inhabit and use it. Build

it wrongly, and the Devil will employ it. The development of the mind, then, means practically the development of the brain;* and the building of a brain is a part of education.

* "Whatever may be our opinions as to the relations between 'mind' and 'matter,' our observation only extends to thought and emotion as connected with the living body, and, according to the general verdict of consciousness, more especially with certain parts of the body; namely, the central organs of the nervous system. The bold language of certain speculative men of science has frightened some more cautious persons away from a subject as much belonging to natural history as the study of any other function in connection with its special organ. If Mr. Huxley maintains that his thoughts and ours are 'the expression of molecular changes in that matter of life which is the source of our other vital phenomena;' if the Rev. Prof. Houghton suggests, though in the most guarded way, that 'our successors may even dare to speculate on the changes that converted a crust of bread, or a bottle of wine, in the brain of Swift, Molière, or Shakspeare, into the conception of the gentle Glumdalclitch, the rascally Sganarelle, or the immortal Falstaff,' — all this need not frighten us from studying the conditions of the thinking organ in connection with thought, just as we study the eye in its relations to sight. The brain is an instrument necessary, so far as our direct observation extends, to thought. The 'materialist' believes it to be

Secondly, brain is here made to include the cerebro-spinal axis. The spinal cord, medulla oblongata, and cerebellum are so intimately connected with the brain in function and structure, that it is difficult to draw an exact line of demarcation between them: for our present purpose, it is better not to undertake to do so, but to consider the brain as standing for this whole group of organs. There are physiologists who would make the brain include all the ganglia of the nervous system and their inter-nuncial fibres.*

wound up by the ordinary cosmic forces, and to give them out again as mental products; the 'spiritualist' believes in a conscious entity, not interchangeable with motive force, which plays upon this instrument. But the instrument must be studied by the one as much as by the other: the piano which the master touches must be as thoroughly understood as the musical box or clock which goes of itself by a spring or weight." — OLIVER WENDELL HOLMES: *Mechanism in Thought and Morals*, pp. 7-9.

* "In that action and re-action, however, between the mind and all that is outside of it, in which the conscious life of every human *ego* consists, the whole cerebro-spinal system participates." — WILLIAM B. CARPENTER: *Principles of Mental Physiology*, p. 123, Am. ed.

Thirdly, let us come to an agreement as to the meaning of education. Education and study are apt to be confounded as synonymous; whereas study, or literary culture, is only one part of education. An educated person is something more, and much more, than a college graduate. In this essay let us remember that education is used not in the narrow sense of book-learning, or of school-training, but in its proper philosophical and physiological signification, — of all that training, alike of the brain and of the body, which yields the just and harmonious development of every organ.* When such harmonious

* "Education is an affair of the laws of our being, involving a wide range of considerations, — an affair of the air respired, its moisture, temperature, density, purity, and electrical state in their physiological effects; an affair of food, digestion, and nutrition; of the quantity, quality, and speed of the blood sent to the brain; of clothing and exercise, fatigue and repose, health and disease, or variable volition and automatic nerve-action; of fluctuating feeling, redundancy and exhaustion of nerve-power, sensuous impressibility, temperament, family history, constitutional predisposition, and unconscious influence; of

development is attained, the cerebral ganglia in both sexes become the controlling power of the organization; education then has done its perfect work; and mind pours out its noblest manifestations.

One of the indispensable objects of education is to build a brain, and to build one of the right sort. In this architecture, schools and colleges play an important part. Their methods may aid or obstruct Nature's process of building. Many of them have obstructed and almost thwarted Nature's way of work. Especially is this true with regard to American female education, which has looked upon a girl as if she were a boy, treated her as if she were a boy, and trained her as if she were to have a boy's destiny. In the "higher education" of woman, which the future has in store for her, this error of

material surroundings, and a host of agencies which stamp themselves upon the plastic organism, and re-appear in character." — *Popular Science Monthly*, November, 1873, p. 112.

ignoring her peculiar organization must be avoided. How to avoid it, woman must largely determine for herself. "Now when there is so much agitation to give woman larger mental opportunities, and she is pressing for the advantages of a higher education, we have a right to expect that she will consider the subject from her own point of view, and supply the great educational need that has been so long recognized and deplored. The new departure of higher female education should unquestionably be from the results of the medical profession. We believe that physicians have by no means yet taken the share in general education that the interests of society require; but when the mental cultivation of women is to become systematic, and they have their own higher institutions, the agency of physicians will be indispensable." A necessary and preparatory condition for the building of the best possible brain out of the female organization is to diffuse through the community a knowledge of the physiology of woman. For this, as

well as for other purposes, there should be a class of intelligent and well-educated female physicians, who, instructed in the peculiarities and physiological needs of the female constitution, would have exceptional opportunities for spreading among their own sex sound and rational views of female development.

A wise and appropriate system of education, in its effort to build a brain either for the male or the female organization, will endeavor to aid and imitate the process by which Nature performs the same task. Herein physiology can render infinite service to education,—a service that the latter cannot afford to refuse.

It is impossible, within the limits of this paper, to give even an outline of the wonderful process by which that delicate and marvellous engine, the human brain, is built up,—an engine which is only a few inches in diameter, whose weight, on an average, is only about forty-nine ounces, which contains cells and fibres counted by hundreds

of millions; cells and fibres that vary in thickness from one-millionth ($\frac{1}{1,000,000}$) to one-three-hundredth ($\frac{1}{300}$) of an inch, — an engine, every square inch of whose gray matter affords substrata for the evolution of at least eight thousand registered and separate ideas; substrata in the whole brain for evolving and registering tens of millions of them, besides the power of recalling them under appropriate stimulus, — an engine, parts of which are sensitive to innumerable vibrations in a second,* — an engine that transmits sensation, emotion, thought, and volition, by distinct fibres, whose time-working has been ingeniously measured to fractions of a second, — an engine, a mechanism, that can accomplish this, and greater wonders still, without conscious friction, pain, or disturbance, if it is only properly built,

* "We believe the statements that the sensation of violet is produced by the striking of the ethereal waves against the retina more than seven hundred billions of times in a second," &c. — GEORGE HENRY LEWES: *Problems of Life and Mind*, p. 21.

and its working not interfered with.* Not even an outline can be given here of the curious process by which Nature builds this mechanism of inconceivable delicacy and power. Only a few salient points can be dwelt upon, that may serve as hints for the educator's guidance; and these can be presented only in the most general way.

I once asked a successful merchant and manufacturer, who had accumulated a large fortune, how he managed to make money at a time when all others who were engaged in the same business were losing it. He replied, that he had practically learned every detail and branch of his business so thoroughly, that he could at any time, if necessary, take the place, and perform the special work, of any of his workmen. In one and

* The reader who desires to consult authorities for these statements is referred to *Mind and Body*, by Alexander Bain; *Helmholtz*; *O. W. Holmes*, *Op. Cit.*; *Mind and Brain*, by T. Laycock, M.D.; *Mental Physiology*, by W. B. Carpenter, M.D.; *Body and Mind*, by Henry Maudsley, M.D.

a most important sense, he was made by and out of his business. His efforts to practically learn every detail had developed him. Suppose his business branched into one hundred different directions, terminating in one hundred different sorts of labor, each sort of labor affording occupation for one or more workmen. In becoming acquainted with each of these hundred details, and in supervising the workmen that wrought them out, he acquired a knowledge which no other experience or education could give him. So far he was made out of his business, developed by it. If, in his preparatory training, he had learned only ninety, or eighty, or fifty of the branches of his business, he would have been, *pro tanto*, less developed. His business consisted of three great departments, — manufacturing, exporting, and importing. The management of these reflected itself back upon his development and character. If he had neglected, or not acquainted himself with, one of these departments, — exporting, for example, — he would have been so

much the less developed: he would have lost the special knowledge and training that an acquaintance with the exporting part of his business would have given him. This loss would, of course, be proportionately greater than that resulting from inattention to a single one of the hundred details which entered into the great whole of his business.

Observe, that here are two distinct things which are not to be confounded. One is the growth or development of the man by reason of the special effort, training, and knowledge, which came from learning every detail of his business, as well as from managing the whole; and the other is the character and amount of mental force thus developed. One is the process of development: the other is the result attained. One is the re-acting of the business on the man: the other is the merchant developed by the re-action. If while my mercantile friend was learning his business, getting this part of his education, he had omitted to become acquainted with a

single detail, he would have developed just so much less mercantile power: he would have become just so much less of a merchant or manufacturer. When the power was acquired, he could exert or spend it in any direction he chose. First, there was growth, the force for which was supplied from a hundred sources; and, secondly, there was a power which was grown.

One other observation is important in this connection. We have supposed that a hundred details composed the body of this man's business. If some or all of the details had been different, his kind of growth would have been different, though it might have resulted in giving him equal power. An omission of one or more of the details, or a change of one or more of the details, would have yielded a different result. There is a different quality in the brain, grown by different callings, — as banking, manufacturing, and agriculture, — and a separate flavor to the resulting character.

This illustration presents in a rough way

some notion of Nature's method of brain-building. The brain is the axis, or central organ, of the body, which, by internuncial fibres, — telegraphic wires, — is connected with innumerable small centres called ganglia, and with every part of the system. The ganglia, or separate centres of nervous power, act more or less automatically, but are responsible to, and in constant communication with, the brain. Calling our mercantile friend the brain, his workmen the ganglia, his business the labor of the human organization, and we shall get a notion of Nature's way of educating, — that is, building a brain, — sufficiently accurate for our present purpose. Just as the merchant grew out of his business by becoming acquainted with and supervising every detail of it, so the brain grows by taking part in and supervising the growth and function of every organ. If a single organ is wanting, or a single function not performed, just so much less brain development results.

“Pluck one thread, and the web ye mar;
Break but one
Of a thousand keys, and the paining jar
Through all will run.” *

Just as the merchant, by his practical acquaintance with every detail of his business, was able to manage his workmen better, and obtain a better total result, than his competitors, and was also himself a more fully developed man in consequence; so the brain, which has a practical acquaintance with the working of every ganglion and function, gets a better total result out of the body than other brains do, and is also itself a better brain. As in the case of the merchant, we recognized his business-growth as one fact, and the result attained as another and distinct fact; so, in the case of the brain, there are two distinct matters: one is the development of the brain by reason of its special connection with all the organs and functions of the body; and the other is the brain thus developed: one is the progressive

* WHITTIER: *My Soul and I*.

development; and the other is the result. As the merchant, after he was made one by his business-training, could direct his energies in any direction ; so the brain, after it is developed, can have its force turned in whatever direction volition may elect. Once more : our mercantile friend had learned his business so well, that he could, when necessary, replace any of his workmen, and perform any workman's labor. Physiologists tell us, that the connection between the brain and the rest of the nervous system — such as the sympathetic ganglia, for instance — is so intimate, that, if surgeons could make the anatomical transposition, the brain would take the place, and perform the labor, of other parts ; and, conversely, other parts that of the brain.*

* "The physiological fact first enunciated by me, and now adopted by some teachers of great eminence (Vulpian, Gavarret, &c.), *that nervous tissue is identical throughout in property as in structure*, has extremely important consequences. For, if the property be everywhere the same, all the functions into which that property enters must have a common identity." — GEORGE HENRY LEWES : *Op. Cit.*, p. 124.

An apposite physiological illustration of Nature's process of building a brain, which we are trying to expose, may be found in the relation of the left brain to the right arm and right side of the body. A large majority of the world are right-handed and right-sided. The right hand and right arm are stronger, and more obedient to the will, than the left: so are the right leg and right foot. The cause of this right-sidedness is to be found in the fact that the left brain is the largest. Most of the nerves leaving the brain decussate, and cross to opposite sides of the body. The right brain animates and controls the left arm and hand: the left brain animates and controls the right arm and hand. The left brain and right hand, the right brain and left hand, develop together. One aids the development of the other. The growth and action of the hand are as necessary to the development of the brain as the guidance and control of the brain are to the development of the hand. In congenital ambidexters, it is said there is less difference between the two

halves of the brain than in right-handed people, and that in left-handed persons the difference is less still. Which started first in the race of development is unknown; and we need not inquire.* It is enough for our purpose to know, that, in some way, the growth, training, and employment of the hands of the young, aid in the building of a brain.† Cut off an arm in infancy, or compel it to inaction, and there will be less brain in adult life. An eminent living physiologist‡ has lately proposed the systematic training of the left hand in children, for the purpose of making the right side of the brain equal the left, and thus increasing the intellectual power of the race. What is true of the hand is true of all other organs of the body. They and the brain are developed by

* Hyatt thinks the larger current of blood to the right arm is the cause. Others, like Gratiolet, think the left frontal convolutions started first.

† "According to my thinking, it is the soul that makes organization, not organization, the soul." — F. H. HEDGE.

‡ Prof. C. E. Brown-Séquard, M.D.

reciprocal action. An unused organ calls out less activity on the part of the brain than a used one. A misused organ may not only call out unhealthy activity of the brain, but often leads to pathological conditions of it. It is necessary for the building of a perfect brain, that all the organs of the body should have their harmonious development and appropriate exercise.

The eye and the ear, the hand and the foot, must be exercised and taught in our schools by appropriate labor, and books no longer regarded as the only factor, if we would have fully-developed brains. "A small difference in the pigment of a sense," says Mr. Bain, "by giving that sense greater susceptibility, may determine the animal's preferences, tastes, and pursuits; in other words, its whole destiny. In a human being, the circumstance of being acutely sensitive in one or two leading senses may rule the entire character, intellectual and moral. The contrast between a sensuous and a reflective nature might take its rise in the outworks of the

sense organs, apart even from the endowments of the brain. In this case, the nervous system would follow the cue, instead of taking the lead, of the special senses.”* The organic functions, such as nutrition and reproduction, affect the nervous system in a way not less potent, and scarcely less perceptible, than the special senses.

Recent investigations indicate, if they do not demonstrate, the parts of the brain that preside over special muscular movements, and that, consequently, are more or less developed by such movements.†

It is now important to go one step farther.

* ALEXANDER BAIN: *Mind and Body*, p. 35, Am. ed.

† “Generally it may be stated, that the centres for the movements of the limbs are situated in the convolutions bounding the fissure of Rolando: viz., the ascending parietal convolution with its postero-parietal termination as far back as the parieto-occipital fissure, the ascending frontal, and posterior termination, of the superior frontal convolution. Centres for individual movements of the limbs, hands, and feet, are differentiated in these convolutions.” — DR. FERRIER: *London Medical Record*, March 18, 1874, and *American Journal Medical Science*, July, 1874, p. 27.

We have hitherto dwelt upon the development of the brain as a resultant of its connection with the organs of the body, and supervision of their functions ; of its alliance with the workmen, and supervision of their duties. No allusion has been made to the development produced by specific brain-work, or cerebration, as a factor in brain-building.

This factor is the most important of the whole. On account of its importance and efficiency, it is essential that its action should be comprehended, and its power physiologically guided. Cerebration, including provisionally in that term intellection, emotion, and volition, is the brain at work. It is brain-activity, brain-exercise, brain-labor. The technical work of the school and college, or study, is cerebration. But study is not the whole of cerebration, any more than it is the whole of education.

Appropriate exercise of an organ aids its development, and increases its power. Appropriate locomotion strengthens the legs : so

does digestion the stomach; and vision, the eye. The normal performance of a function strengthens and develops the organ that performs it. The brain is not only no exception to this law, but is an admirable illustration of it. Brain-exercise, that is, cerebration, strengthens and develops the brain. If quality as well as quantity is included in development, no limit can yet be assigned to the extent of the latter, and, consequently, no limit to the manifestations of intellectual and spiritual power that may pour through the brain. I presume we have only an imperfect conception of what the human brain will yet attain to. Compared now as an instrument with what it will be ages hence, when both men and women are appropriately educated, when brains shall be built out of masculine and feminine organizations that have been appropriately trained, and from which hereditary evils have been eliminated, century after century, by the survival of the fittest, — the brain of to-day, compared as an instrument with that brain

of the future, fit for the use of a god, is as rude and imperfect as the lenses of two hundred years ago compared with the microscopes of the present day. It is the duty of our systems of education to evolve such brains.

Study and student-work aid this evolution; but, as we have seen, they are not the only factors of brain-building. Cerebration is brain-exercise; and brain-exercise strengthens and develops the brain. But the brain is evolved from the organization; and, unless the latter is normal, the evolution is imperfect. Moreover, physiology informs us, that conscious, or, more properly speaking, volitional cerebration should not be attempted too early in life. In Nature's order, the nervous system of an individual is the last to attain its full development; and, of the nervous system, the cerebral ganglia reach maturity later than any other part. Obviously the latter should not be put to work till they are capable of labor. Without exercise, an organ will attain little or no

development: excessive or premature exercise will monstrously develop or abort it, — in either case to the injury of the rest of the organism. What Goethe said of an individual in relation to the community is true of an organ in relation to the organism: —

“For, as I know, he injures himself who is singly
Devoted,
When for the common cause the whole are not
Working together.” *

If a hundred boys or girls were educated from the age of three to that of sixteen as John Stuart Mill was, I am certain, that while a few might escape as he did, and attain marvellous brain-power, the majority would end in permanent invalidism, imbecility, or premature death. It is as unphysiological, and fraught with danger, to make the brain work over books before its tissue is ready for that sort of cerebration, as to coax a baby to stand before the bones of its legs are stiff enough to hold up the body.

* Hermann and Dorothea, Miss Frothingham's Translation, p. 60.

It should not be forgotten that the supervision by the brain of the various organs of the body is brain-exercise, although we, that is, the *ego*, may not be conscious of it. Indeed, this fact lies at the foundation of all the previous argument. The brain, receiving its nourishment from the blood, grows by exercise. But there are two kinds of brain-exercise, — one conscious, the other unconscious; one the exercise of the brain in supervising the organization, the other the exercise of the brain in cerebration. Both are necessary to the building of a brain. Neither is competent to the work alone. Our schools have taken conscious cerebration in charge, and pushed it to a dangerous extreme. They have paid very little attention to the other factor.

It may be and has been urged that one of these factors — the unconscious exercise of the brain in supervising the organization — should be left out of any system of education, because it can be safely intrusted to the control of instinct. This is a dangerous fallacy. In-

instinct, it is true, will perpetuate the race; but it will only perpetuate a race of animals. Instinct never rises to the plane of reason: it has no notion of progress: it will preserve the race, and that is all: it cares nothing for the fittest and best. With terrible, savage, and irresistible earnestness and will, regardless of whatever nobility or beauty may be killed by it, instinct goes straight to its object, — the conservation of the race. If our civilization turns over the care of the organization to this relentless power, there will be no hope of progress in the future. Reason alone is capable of solving the two problems, — of securing the highest development of the individual and the perpetuation of the fittest. Reason, therefore, must be the architect of the brain.

It should not be inferred from this statement, that the attention of growing boys and girls ought to be forced upon their organs and functions. Such a course would be as pregnant of evil as the opposite extreme of *laissez aller*. One whose brain ever watches

his stomach is sure to generate a worse dyspepsia there than ever hot bread or unnatural luncheons caused. But reason, led by physiology and experience, should compel sufficient attention to the stomach to insure appropriate nourishment and painless digestion. In like manner should every part of the organization be treated. No organ, or function, or system of organs, whether sexual, nutritive, or nervous, should be regarded as mean, or unworthy of notice, and so remitted to the brutal control of instinct. An appropriate education will include them all within its purview, and, by judicious management, will make them all, in their degree, contribute to the building of a brain, and, by so doing, assure to the cerebral ganglia the control of them all.

If this is not done, and education attends only to the single factor of cerebration, employing in its work only mathematics, the humanities, and the like, the organization is sure to go astray, and (by running into all sorts of errors, diseases, and deformities, to

compel an attention which organs that have had appropriate care never require. The statesman engrossed with social and political problems, or the scholar rapt in thought, may fancy that his metatarsal joints have little connection with his brain; but let gout make one of them blush, and both statesman and scholar will be convinced that the brain has a common interest with its farthest extremity. And this community of interest teaches that the unnoticed growing and proper use of a toe contribute a quota, however small, to the building of a brain. Mr. Lecky says, "that harmonious, sustained manhood, without disproportion, or anomaly, or eccentricity,—that godlike type in which the same divine energy seems to thrill with equal force through every faculty of mind and body; the majesty of a single power never deranging the balance, or impairing the symmetry of the whole,—was probably more keenly appreciated and more frequently exhibited in ancient Greece than in any succeeding

civilization.”* In no respect should a Christian fall below a heathen civilization.

We learn, from these physiological considerations, that the method by which Nature constructs a brain is the same for the two sexes. In both, the brain is evolved from the organization. In both, all the organs of the body are connected with the brain by inter-nuncial fibres. In both, the brain, by means of these inter-nuncial fibres, supervises the separate and united functions of the organs, and co-ordinates and controls their action. In both, this supervision and control is an essential factor in building a brain. In both, the normal development of an organ aids the normal growth of the brain, and the abnormal growth of an organ reflects its error back upon the brain. In both, the brain is favorably or unfavorably affected by the normal or abnormal performance of all the functions. In both, the highest development of the cerebra is con-

* History of Rationalism in Europe, vol. ii. p. 351.

tingent upon, and, in point of time, secondary to, the normal development of the rest of the brain. In both, brain-exercise, or cerebration, such as study and intellectual activity, develop the brain, and throw down upon all the inferior organs a healthy and conservative influence. The parallel is complete between the sexes. The method that builds a man's builds also a woman's brain. But this identity of method in cerebral architecture, which requires that every organ and function in both sexes should have appropriate development and exercise, as a part of brain-building, implies, or rather necessitates, a difference in education between the sexes, just so far as there is a difference in organization between them, and no farther. Identical education of the sexes is in the last analysis equivalent to an unjust discrimination between them: their appropriate and consequently different education is equivalent to the same method of brain-building. The object of education for the sexes is the same. The physiological principle which should

guide their education — that is, the appropriate development of the whole organization, so as to evolve the best brain — is the same. The application of this principle to home, social, and school life, demands diversity of management, — the same law, but diversity of application.

The only difference between the sexes is sex ; but this difference is radical and fundamental, and expresses itself in radical and fundamental differences of organization, that extend from the lowest to the highest forms of life. Progress is impossible without accepting and respecting difference of sex. That it is physiologically possible to diminish it by an education arranged for that end, no physiologist can doubt ; nor can it be doubted that identical methods of educating the sexes, such as prevail in many of our schools, tend that way. One result of a school-system animated by such methods is to make a very poor kind of men out of women, and a very poor kind of women out of men. Fortunate for the Republic, if no illustrations of

the truth of this remark could be found within its borders.

The best quality, noblest power, and supreme beauty of the two sexes, grow out of their dissimilarity, not out of their identity. Differentiation is Nature's method of ascent. We should cultivate the difference of the sexes, not try to hide or abolish it. When a gardener seeks to produce the best possible apple or peach, he selects one whose beauty or flavor is desirable, and cultivates the selected difference. Nature has selected difference of sex by which to give humanity its choicest beauty and quality. The perfection of one sex is unattainable by the other, and at present is rarely comprehended by the other. Each loves and reverences in the other what it cannot grasp itself, and despises any imitation. Let education respect and cultivate Nature's selected difference.

The first step in the practical application of these principles is to heed the voice that fell on Peter's ear, and echoes still in ours, bidding us call nothing common or unclean

that bears a divine stamp. The whole organization, and all its functions, must be lifted above the low plane of animal instinct, and confided to the charge of reason. Sex and its functions must be recognized as factors in education, as aids in brain-building. Something has been done in this direction by the discussions of the past year in Europe and this country upon the periodicity of the female constitution. The secrecy and mystery that rested, like an incubus or evil spell, upon it, have been wrenched from our American civilization and education, and will never be put on again.

The next step, so far as girls are concerned, is to acquire a complete notion of the value of periodicity as an element in female education. This must be done by ascertaining the evil that follows a disregard of it, and the good that follows its normal action. When this has been accomplished, it will be easy to assign to periodicity its proper position among the other factors — such as nutrition, ventilation, cerebation, and the like —

that belong to education, and contribute to the building of a brain.

It is obvious that this factor must be studied with regard to woman alone; for there is nothing like it in the male constitution.

The evils that man incurs from a disregard of his peculiar organization are not the same as those that beset the path of woman; but they are not less terrible than hers. In this regard, his education must be equally circumspect, but very different. When we consider the diseases, breeding rottenness in the flesh and bones, degenerations of the brain, imbecility, impotence, and premature death, with which Nature punishes his errors of passion and sensuality, we cannot justly say, that, even so far as sex is concerned, woman is unfairly weighted for the race of life in comparison with him. An appropriate education will recognize the special differences, guard against the special dangers, and obtain the special benefits that spring from sex.

Having recognized periodicity as a factor

in the education of girls, and having acquired some notion of the evils which a neglect of it may cause, the next step is to assign to it its rightful position as an agent, or force, in the building of a brain.

The importance of its position cannot be doubted ; for it represents not only an essential organ, but an essential system of organs, in the female organism. It is impossible and unnecessary to determine which of the three great divisions of the organization — the nutritive, the reproductive, and the nervous — is the most important. It is enough to know that the *consensus* of all is necessary to the development of each, and equally the development of each, to the evolution and perfecting of the whole. A normal periodical action represents, as a rule, the integrity and proper management of the apparatus, one of whose functions it is, as much as normal digestion represents the integrity and proper management of the nutritive apparatus. Its importance, then, comes chiefly from its representative character. It represents a system

of organs and functions essential to the development of the individual and of the race, — essential to the building of every woman's individual brain, and to the transmission of the accumulated brain-power of the past. Whether we like it or not, we must accept the fact, men and women both, and act upon it, that the brain cannot attain its best development, except through the development of the body. "I do not wish to be called a body, or treated as an animal," said a bright woman. Her aspiration was just; but, for its realization, it is necessary that the animal and the body out of which the woman is built should be made to contribute their share to the building of her brain. When that is built, its grandeur and beauty and power will conceal and transfigure the body. Women have been so long called angels by flatterers, and painted with wings by artists, and sung as goddesses by poets, that some of them are indignant when told that they have bodies. It is to be hoped that men and women will be angels yet, and that the

flatterers, artists, and poets are prophets in disguise; but, if this is to be the case, we may be sure that the *iter ad astra* is not over despised, mismanaged, and diseased bodies, but out of harmoniously-developed, acknowledged, and transfigured ones.*

The practical application of these principles to education is less difficult than appears at first thought. Much, probably the larger part, of the difficulty will disappear as soon as our schools and social order recognize periodicity as a factor in brain-building and education. After this is recognized, experience will be the best guide in solving all other difficulties; and the solution

* The animal part of man is thus observed to be, in a measure, independent of the human, and may maintain a separate existence. The characteristically human part of his organization, however, is not thus independent of the animal organs, but is united to them by an inseparable bond. The cerebrum is the flower of organic creation, its supreme coronation. Its vital integrity is maintained by the corporeal system. The radicle may live and flourish independent of the flower; but, if the flower be disconnected from the radicle, it speedily dies." — D. A. GORTON, M.D.: *Principles of Mental Hygiene*, p. 19.

must be worked out chiefly by women themselves. Fortunately, Nature, though an implacable enemy, is the kindest of friends. Obedience to her smooths every pathway. Physiology assures the teacher and the home that Nature only requires in this direction the normal performance of the function. Whatever does not interfere with its normal performance is admissible. So susceptible is it of management in youth, that cerebration alone will sometimes guide it. I have seen cases in which the prescription of study — mental work — alone was enough to turn its abnormal into its normal performance ; and other cases precisely the reverse, in which study, emotion, or other mental excitement, especially at the juncture referred to, so checked or increased it as to insure disease and threaten life. Surely a function that is so sensitive and ductile during the age of development, and, if then mismanaged, so difficult of control in later years, and that represents such an important part of the female organization, should be reasonably guided and managed.

Like every other function, its normal performance not only strengthens the organs represented by it, but the system at large; so that special and general growth and power are gained by its appropriate management. It should not be forgotten, in this connection, that the pain (dysmenorrhœa) by which Nature so often and so severely punishes a neglect of this function uses up, that is, spends, an amount of nerve-force in exact proportion to the pain endured; and that this nerve-force represents power withdrawn from the brain. If proper methods of education are devised which will not develop pain, there will be greater nerve-force at command for brain-work in adult life.

Suppose education, instead of standing, as it generally does with us, for schooling alone, stood, as it ought to do, for all appropriate training, we might divide it into the four divisions, of physical education, or exercise: social education, or society; domestic education, or home life; and technical education, or study. If not more than five

hours * a day, or, including music, six hours a day, were devoted to studying, both in school and out, leaving the rest of the time for other purposes, we should probably find that Nature's normal remission of education, her "Sunday of monthly rest," would take something like the following order,—at least,

* "While it is easy oftentimes to see that this or that person is overtaking his powers, it is impossible to lay down any general rule on the subject, that would not require too much of some, and too little of others. In *youth* and early manhood, especially if the constitution is deficient in vigor, there would be danger from a degree of application that might be safe enough at a later period, when the brain has become hardened by age and regular labor. So, too, habits of active physical exercise will enable a man to accomplish an amount of intellectual labor that would utterly break down one of sedentary habits. After making all due allowance for these differences, I think we may say that few can *exceed six hours a day* of close mental application without *seriously* endangering the health of the brain; while, for most persons, a not unreasonable degree of prudence would prescribe a much shorter period" (ISAAC RAY, M.D.: *Mental Hygiene*, pp. 110, 111). The *Italics* are the author's. The above statement evidently refers to boys and men. It is undoubtedly true of them; but it applies to girls during the epoch of development with much greater force than it does to boys.

such has been my observation of it, — *all girls would require a periodical remission of variable length, from the labor of physical education*, such as gymnastics, long walks, and the like; and also *all* would require a remission from the labor of *social education*, such as dancing, visiting, and similar offices. The other two departments of education, domestic and technical, would only be interfered with in exceptional cases; but, in these exceptional cases, the remission is of vital importance to the individuals themselves, and the school must provide for it, or be directly responsible for lifelong invalidism, possible sterility, and death. If our schools continue to require *seven, eight, and nine hours* of daily study, including in this estimate out-of-school study, there should be a periodical intermission *for female pupils of school as well as of physical and social education*. The influences of school and social life are so interwoven, that it is difficult to separate them. There is an undoubted tyranny of fashion over them both, to which many yield

an unquestioning and often a willing obedience. There is also a tyranny of the school over the family and social life, which presses lightly on boys, but heavily on girls. A more flexible school system will abolish the tyranny of the school over the family; and a nobler civilization, that of fashion over social life.

The stimulus of emulation, of constant, daily competitive work, affects the two sexes differently during the epoch of development. A boy is less susceptible to this stimulus at that time than a girl; so that when the same stimulus is applied to the two sexes, at the same time and in the same way, if enough of it is applied to keep a boy well up, it is a physiological injury to a girl; if only enough is applied to keep her properly at work, the result is a physiological injury to him.

These and many other matters of detail, including co-education, must be determined by experience. Physiology is concerned only with the principles of healthy develop-

ment, which, within their range, must guide the education of both sexes. Physiology demands an appropriate education for both, and condemns the effort, which, by consigning both to an identical education, would abolish Nature's process of differentiation, and produce identical sexual development and the end of the race. Brains of highest worth must be built by an educational process that leaves men potential fathers, and women potential mothers. Sensuality must not be allowed to make animals of one sex, nor ill-regulated cerebration to unsex the other.

An eminent English physiological authority has recently defended the thesis, that, because there is sex in mind, there must be sex in education.* I should prefer to alter the terms of the statement, and say, that, because there is sex in body, there must be sex in mind, and sex in education. When this is acknowledged, and one of Nature's vital factors in brain-building, that has been so long refused a place in our

* HENRY MAUDSLEY, M.D.: *Fortnightly Review*, April, 1874.

training of girls, is added to the other factors of education, and entered in the rubric of the schools, we may hope for brains of the largest development and finest quality. When that time arrives, we may hope for both sexes that identical will give place to appropriate education; that brains built out of the body and by the body, as well as out of books and by books, will crown and control every organ and function; that sex will be made subservient, not to passion, but to reason; and thus shall not only the grasp of our race be permanently assured upon this Western world, but the highest development of the individual, the noblest manhood and the loftiest womanhood, be assured here likewise.

AN ERROR IN FEMALE BUILDING.

PART II.

AN ERROR IN FEMALE BUILDING.

Wie soll man aber diesem Uebelstande, dem Gegensatze zwischen Schul- und Naturgesetze abhelfen? Eins von beiden muss nachgeben! Das Naturgesetz ist nicht willkürlich, es beruht auf ewigen Dictaten: das Schulgesetz aber ist ein willkürliches, von Menschen gemachtes, zeitliches; es muss sich dem Naturgesetze unterwerfen. — *Schul-Diätetik*, p. 186.

By a recent essay,* carefully limited to a discussion of the single factor of periodicity in its relation to the education of girls, and only to the pathological side of that factor, or the evils which follow a disregard of it, I hoped to call the attention of teachers and the community to this concealed and essential element. This hope has been fulfilled. Abundant evidence has appeared, not only of the interest taken in the subject of the relation of sex to education, but of a general convic-

* Sex in Education.

tion of its great importance ; and numerous data have been furnished by observers in different parts of the country, which are of great value in determining the relation of periodicity to the other factors of education. Like the essay referred to, many of these data show only the evils which a neglect of periodicity generates ; but these evils indicate and measure the infinite good that would follow a normal management of it. They should be fully comprehended, so as to be avoided. Like lighthouses along the coast, that warn the mariner of rocks and quicksands, a knowledge of them signals dangers that threaten to shipwreck our race in this Western hemisphere.

Some of the following statements have already appeared in the public journals. Most of them have been sent to me privately, without solicitation, and coupled with a permission to publish them, if their publication was deemed desirable. They come from a variety of sources, and are the more valuable on that account. A large number have been

furnished by women who have themselves suffered, or whose daughters have suffered, from the inattention of our schools to the periodicity of the female constitution. The number and size of all the communications that I have received upon this subject would form a portly volume. The few that are herewith published concern especially the relation of sex to education, and are presented as a contribution to educational and social science. It will be observed that all of them are the result of the personal observation of the writers who report them. They fall naturally into three classes,—1st, Those from public documents, like the Report of the State Board of Health of Massachusetts; 2d, Those from parents and school-teachers, who approach the subject from a parent's or teacher's point of view; and, 3d, Those from physicians, who look at it from a physiological standpoint.

1st, PUBLIC INVESTIGATIONS.—In the Fifth Annual Report of the State Board of Health of Massachusetts, which appeared January,

1874, there is an article on "School Hygiene," by Dr. Frederick Winsor of Winchester. It was prepared by direction of the Board. As one method of obtaining data with regard to the hygienic condition of the schools of Massachusetts, the Board sent a Circular to teachers, physicians, and others in the State, soliciting replies to a series of questions, of which the two first were these:—

"1. Is one sex more liable than the other to suffer in health from attendance on school?

"2. Does the advent of puberty increase this liability?"

Replies were received from one hundred and sixty persons, of whom one hundred and fifteen are stated to be physicians; nineteen, physicians and members of school committees; fourteen, teachers of experience; and six, superintendents of schools. The Circular of the Board requested that all the replies should be "based on personal observation." The result of this inquiry, so far as it concerns the relation of sex to education, may be gathered by looking over the following ex-

tract from the Report, which also presents the conclusion that Dr. Winsor reached upon the subject we are considering : —

“ *Question 1.* — Is one sex more liable than the other to suffer in health from attendance on school ? ”

Answered substantially as follows : —

“ Females more liable than males,” by	109
“ Males more liable than females,” by	1
“ Both alike liable,” by	31
“ Neither is in danger,” by	4
“ Not in district schools,” by	1
“ Not if both sexes exercise alike in the open air,” by	1
“ Unable to answer,” by	5

One correspondent says, “ Girls in the proportion of two to one ; ” another, “ During forty years’ practice in the country, I recollect but one instance of a male who has suffered ; while I can recall many instances of females.”

QUOTATIONS FROM CORRESPONDENTS.

118. “ The female scholars are more susceptible to emotional influences ; and if there be stimuli in a school, appealing to pride and

vanity, they are so emulous as to injure themselves.

“This is the source of most of the injury suffered by the scholars in most schools.”

80. “Beyond doubt, the girls, from the fact that they *are* girls, are more liable to suffer than boys. In my own experience with both sexes, I found this excess of liability to be very manifest; and I governed my methods accordingly, keeping limitation in abeyance with them, and moderating brain-work, and supervising physical exercises.

“At certain periods, I think that study, with girls, should *wholly cease* for some days. Any one who has taught boys and girls — in separate schools, I mean — must have noticed the greater proportionate irregularity of attendance by the latter; and, as a parent, he would readily know the reason, and know the necessity of cessation from work.

“I refer to girls between twelve and twenty years of age.”

148. “While pleas for lenity to boys, on

account of feeble health, are rare, they are a common thing in connection with the girls."

102. "My pupils were all girls. I gave them more variety of study, and less hard labor, than boys can bear."

Many others of the 109 express themselves in terms equally strong; some of whom will be quoted elsewhere.

"*Question 2.* — Does the advent of puberty increase this liability?"

Answered substantially as follows:—

"Yes," by	120
"No," by	12
"Uncertain," by	9

Of those who answer, "Yes," many add, "for girls;" and it is evident that nearly all have the same limitation in mind.

Two call attention to the important fact, that, at the time of the second dentition, children are peculiarly liable to be injuriously affected. It is a fact that many boys, especially those of rapid growth, need a particu-

larly careful hygienic watch at the advent of puberty.

QUOTATIONS FROM CORRESPONDENTS.

148. "This baleful result becomes very strikingly manifested as the girls approach the age of puberty. Under the abnormal conditions of the physical system produced by this cause, not only do the more emulous and studious girls suffer from the study which they evidently ought to intermit, but the ordinary and habitual task-work necessary to keep abreast of the studies is far too severe a draught on many constitutions. Not a class passes through our high schools of which some of the girls are not compelled to discontinue a part or all of their studies, for a time, on this account; and, not unfrequently, they cease altogether their connection with the school, too feeble to venture a renewal of their studies. The teachers are watchful and considerate in this behalf; but it is scarcely possible to individualize so as to guard against evil results. Little or

nothing of all this is noticeable in regard to boys."

80. "It is precisely that advent, and its consequent peculiarity with girls especially, to which I refer ; and any trifling, or neglect of care, in regard to it, is all but unpardonable. With boys the case, under my experience, was wholly different. If they respect and leave innocent God's sacred means of the physical life of our race, their own physical strength will go on increasing, and they will need no other recreative unbending than what they will get from the usual manly exercises of our properly-spent vacations ; or, under a better system than ours, from union of technic hand-work with mental study."

111. "Girls suffer more than boys from attendance at school. Were, however, the habits of the two sexes the same in regard to out-door play and exercise, there would probably be no difference between the power of resistance in one and the other sex till the approach of puberty. As a girl draws near this period, menstruates, and becomes capa-

ble of child-bearing, the school discipline and work must bend to her bodily needs in a manner not required by boys. Her menstrual week (one-fourth of her time, or nearly that) must be respected. During these days, her mental powers are easily overstrained. The depressing influence of confinement in the schoolroom, long-continued standing, or even sitting, do her bodily harm. The neglect of these demands of her system, as that of an intended breeder and nurser of men and women, the effort to treat her as though she were a boy, will, in a large minority of instances, do unmistakable harm to those concerned, and, eventually, to the whole community. Could the custom of keeping girls between the ages of thirteen years and nineteen out of school, and at moderate rest, during the days of menstruation, become established among us, a certain number might suffer restraint not absolutely demanded; but the general result would be an incalculable gain to the health, present and prospective, of the inhabitants of this Commonwealth."

“It is the opinion of more than *seven-tenths* of the correspondents, that girls are more liable than boys to be injured in health in our schools; and, of *eighty-seven-hundredths*, that this liability increases with the advent of puberty; and, to support this opinion, detailed testimony might be quoted from all quarters, both from sources already accessible to the public and from manuscripts.

“But it is unnecessary. This greater liability in the female is an *established fact*; and our State and local school-boards should at once take steps to modify our system of education in accordance with the fact, however great may be the change required. Up to the thirteenth year, identical co-education is hygienically safe, with the proviso that we make a most cautious use of emulation in all its forms, since at *no* age is it as safe for girls as for boys. After the thirteenth year, girls should not be tasked or disciplined just as boys are. For them, such flexibility should be introduced into the school *régime* as shall fully recognize the feminine law of periodi-

city, for want of which recognition our high and normal schools, and the first classes of our grammar schools, are injuring many, and endangering all their female scholars. Were it not that so small a proportion of our school-children enter (in Boston, in 1870, $3\frac{2}{3}$ per cent), and so much smaller a proportion (scarcely one per cent in Boston) persevere in the high-school course, we should stand aghast at the extent of this mischief. As it is, it falls mainly on those whose school education is carried farthest, to whom we have been accustomed to point as the pride and flower of our common schools. And the numbers of this class are increasing in a proportion much greater than the *general* increase of school-attendance. In 1872, the increase of our school-attendance was 2,941, while the increase of scholars over fifteen years old was 1,238, — more than *four-tenths* of the whole increase. Seven-eighths of our teachers suffer from it, but would suffer far less, if they had not been under the same system during the *formative* period of life. That

school-system which is in harmony with hygiene will recognize not only the law of periodicity, but the fact, that, throughout the *whole* time between the thirteenth and the nineteenth year, the female cannot, with impunity, bear the same *mental strain* as the male."

The principle here insisted on involves a very great change in our school-methods, but by no means an impossible change. Let once the necessity of it be widely felt, and the reform "will get itself made," as has been wisely said. It need not involve a great increase of absenteeism.

In reply to a different question from the Board of Health than either of the two previously quoted, a correspondent, numbered 148, says, —

"It is, however, the nervous system of the girls which is affected by school-influences in a very peculiar and striking manner, far beyond what occurs in the same connection with boys. Delicately sensitive in their or-

ganization, as compared with the boys, and quick to respond to appeals to their love of approbation, the studious girls are filled with eager emulation the moment that a prize is offered for their competition, or when the ordinary stimuli, active in every thoroughly earnest school, inspire to severe exertion. Their effort becomes painfully intense. They strain every nerve in their endeavors, a restless anxiety meanwhile morbidly preying upon and diminishing their strength. And in those localities where the principle of emulation is systematically and largely employed in the schools, where public examinations, exhibitions, festivals, medals, and other details of competitive machinery, are ceaselessly exerting a harassing influence, the effect upon the girls must be fearfully pernicious. Many a wreck of health must periodically occur, — yes, many a forfeiture of life itself.”

The third section of the Fifth Annual Report (1874) of the Bureau of Statistics of

Labor of Massachusetts contains the following curious and interesting statements. The investigations reported by the Bureau are novel in their character; and the results obtained have a direct bearing upon the relation of sex to education, as well as to labor:—

“The important consideration of the effects of labor upon young girls at peculiar periods of life has escaped attention equally with that of their education at the same periods. The most excellent monograph of Prof. Clarke, recently published, has treated ably of the latter regard.

“We must dissent, however, from his statement, as far too inclusive, that ‘the female operative, of whatever sort, has, as a rule, passed through the first critical epoch of woman’s life: she has got fairly by it.’

“Actual investigation in this direction shows a *very large* per cent of employees in various factories and burdensome employments, occupying the whole of the day, where

the average age of puberty has not been passed, when, certainly, the menstrual function has not been well established. Certain investigations undertaken within the past year in regard to the effect of employments requiring a considerable expenditure of nerve-force for at least some period of the processes, have produced some interesting and curious results. An observation of females, varying in age from sixteen to forty, engaged in basket-making, a labor requiring wonderful rapidity of manipulation, showed, that in half a dozen new operatives placed upon the work in a well-ventilated, light, and cheerful room, —

“ 1. Five lost in weight in the first week appreciably, the remaining one, a slower person, apparently not at all.

“ 2. The youngest lost the larger per cent of weight.

“ 3. Two — one sixteen, and another eighteen — experienced disturbance of the menstrual function in the first month of employ, though previously regular.

“4. The slow person began to lose weight appreciably on the fourth week, when her motions had quickened.

“5. The decrease in weight continued with all (though there was no diminution of appetite or general health specially noticeable) for from four to six weeks, when, the movements of the digits having become more mechanical, it ceased, and the weight remained essentially unchanged for a few weeks, varying with individuals, from one to three, when in four of the six it increased perceptibly, in the other two slightly. The operatives of this department state that a change in the shape of their work, requiring for a time more concentrated thought, will, if it occur at that juncture, effect sometimes a disturbance of the catamenial function. *In all, familiarity with the work tends to remove the difficulty.* From these and the other attaching circumstances, we have been led to conclude that there is a direct effect of bodily exertion, in females, upon the peculiar function of the sex; that this is greatest with the

youngest; that it is directly proportioned to the degree of mental activity involved, and is to be considered gravely in the regulation of mechanical pursuits employing such labor.

“Information has been furnished us by a lady long in charge of the sewing-room of a large shoe-factory where foot-power was used exclusively, that, in general, she had arrived at the same conclusions.

“The agent of one of our largest cotton-factories has investigated the same subject, and has formed the same conclusions in regard to young female operatives. A full statement of his careful and extended observations is soon to appear.

“The work of counting rattan strands, done at the manufactory of that material at Wakefield, requiring concentration of mind constantly, is an exemplification of the foregoing findings. If girls of tender years were placed at this work, which keeps one constantly on the feet, there can be no doubt that the disturbances that the older ones employed experience would grow into serious

evils. The barbarous practice of keeping shop-girls all day upon their feet cannot be too severely reprehended. That a joint interest in the home and factory conditions of capital and labor will secure to both the largest pecuniary return, and the best moral and physical influences, and, the higher the grade of intelligence on the part of both, the more successful the results, there can be little doubt."— *Report for 1874*, pp. 46, 47.

The Bureau conclude the part of the report from which the preceding statements are taken, by presenting to the legislature of Massachusetts five recommendations for the improvement of the laboring classes of the Commonwealth, one of which is the following:—

"A care that certain requirements of existing law, statute and physical, should receive full recognition in the employment of labor as affecting females in particular."— *Report*, p. 48.

From this it appears that the Bureau of Statistics of Labor of Massachusetts, after investigating the relation of sex to labor, have reached a conclusion similar to that which the Board of Health of the same State arrived at, after investigating the relation of sex to school-work. One demands, in the interest of humanity, that the laws should recognize sex in their protection of labor ; and the other demands that our school-system should recognize it in the organization of our schools.

We next come to the personal observations of parents and teachers.

Last February I received a letter from a gentleman, personally a stranger to me, but well known as an accomplished scholar and writer, to the effect that the case of his daughter, who died less than a year previous, aged eighteen, would furnish an excellent illustration of the evil results of inappropriate methods of female education ; and that he would be willing to have the history of her case published, if its publication would

render any service to the cause of sound education. In reply to a request for the history which he had so kindly and unexpectedly offered to prepare, the following note was received, which forms an appropriate and sufficient preface to the sad account that follows it:—

MARCH 30, 1874.

DEAR SIR,—The enclosed statement is from the pen of my wife. If it can serve the right, you are at liberty to make use of it—in whole or in part, in the language in which it now stands, or in modified or entirely different language—as in your judgment may seem best.

You, of course, will not give names, certainly not in full.

Very truly,

It is proper to say, that except a few slight verbal alterations, which the writer herself would probably have made if she had cor-

rected the proofs of her manuscript, no changes have been ventured upon in the language by which a mother presents the instructive lesson of her daughter's method of education, and its result.

FROM A MOTHER.

“At the age of fifteen Mary was a remarkably fine and healthy girl: she seemed to be safely over the critical period, and, till after that time, had never suffered as many girls do at the commencement of their womanhood. Her thinking powers were quick and vigorous; and she was the pride of her teachers, and joy of her parents. Unlimited mental progress was laid out for her; and it seemed that there were to be no bounds to her acquirements.

“She had then finished a good common school education, at the best high school, and had entered an institute for young ladies (a boarding-school) of the highest character. The curriculum of study there was compre-

hensive ; and it required the closest application of an ambitious scholar to succeed.

“ One hour was allowed for walking and recreation during the day ; and half of that hour could be spent, if the pupil desired to do so, in the music-room. As the months went on, I began to notice that her complexion, which had been pure rose-leaf, became almost transparent, and that the fresh blood left her cheeks : still she did not complain, nor lose flesh, but said sometimes, that, if she could *sleep a week*, she would enjoy it ; and that it almost always happened, when she was unwell she had the most to do, and the longest to stand. Her progress in her studies was wonderful ; and it seems incredible to me now that we should have let her devote herself so entirely to them. Her musical talents were great, and they were under cultivation also : when she was seventeen, she was the first soprano singer in the choir of the church to which she belonged.

“ At last I began to be alarmed at the remarkable flow whenever she was unwell, and

at the frequent recurrence of the periodical function. I felt as if something should be done, and consulted our family physician as to what could be given her, and how this increased action could be stopped or diminished.

“He prescribed iron as a tonic, but said that we should do nothing more; for that ‘every woman was a law unto herself,’ and, as long as nothing more serious occurred, she was to be let alone. This from a man who had daughters himself, and eminent in the profession! Never a word about rest, never a caution that she could overwork herself, and thus bring misery for the remainder of her life. She left school, in June of that year, with noble honors and an aching frame, and after two months’ vacation and rest, which seemed to do her a world of good, began in September another year of unremitting hard study. Loving and gratified parents, proud and expectant teachers, looked upon her as capable of accomplishing all that had ever been done by faithful students, and of ad-

vancing far beyond all who were in the graduating class with her.

“Her teachers were as kind as any could have been. I think the fault was in the system that requires so many hours of study, no matter what the condition of the pupil may be.

“As an instance, twenty-five questions were given her to be answered. She was seated at a table, without books, from ten, A.M., till eight, P.M., ceaselessly *thinking* and writing; and the twenty-five questions in classical literature were faultlessly answered,—and that, too, at a time when, had I known what I know now, she should have been resting on her bed.

“Her father, to whom the paper was shown for his approval, wrote on the margin, ‘It seems to me that the task imposed here was a *great one indeed*; but it has been performed with good success.’ I do not for a moment mean to find fault with her teachers; for kinder, more interested ones no pupil ever had; and the delight that a teacher derives

from a painstaking and appreciative pupil cannot be understood by those unused to teaching.

“While the dear child was meeting our utmost requirements as a scholar, the foundations of her life were being sapped away.

“In May, 1872, a little more than two weeks before the June commencement, she was taken with fearful sickness and severe chills, just after one of the hemorrhages that came every three weeks regularly. Our doctor was called; and the first thing she said to him was, ‘Doctor, I must not be sick now. I cannot afford the time. I *must* be well for commencement.’ For four days she suffered very much, but quinine and all sorts of tonics brought her up; and the two weeks that should have been taken to get well in were spent in study, study, study. All the examinations were passed successfully, even brilliantly; and she was graduated with all the honors of the institution. Oh, how proud we were of her! and when she came home, frail and weak as a wilted flower, we

said that she should have a long rest, and every comfort that we could give her.

“All summer she remained in the Highlands of the Hudson; yet, when autumn came, she was not as well as we thought she ought to be, though very much improved with regard to the monthly turns; they recurring at right times now.

“In September she commenced studying again: her French and music were continued, so that she might become still more accomplished in those branches; and lectures on rhetoric and moral philosophy were attended also.

“The habit of study was so strong upon her, that she could not give it up. Now came swelling of the joints and fingers, and the old trouble, all of which she would have kept to herself if she could have done so; but I was so anxious about her, that I ascertained her condition, went to the doctor again, and begged him to tell me what to do that would stop the weakening periodical disturbance, as I was persuaded that was the cause

of her trouble. He said she had inflammatory rheumatism, and prescribed *soda*. But I was not to do any thing for the other matter; and, against my own convictions, I let things take their course. Oh! if he had said, ‘Take her home, and stop her studying.’ Armed with such authority, I could have done it; and how do we know but she might have been with us now, if I had done so?

“But she worked on till the 25th of December. Then she came home, and said decidedly she would study no more till she was *well*.

“We were rejoiced at her decision; for, although we were anxious that her education should be completed and thorough, we had felt for a long time that her health was becoming impaired. Still we were sure she had a good constitution, and thought that would carry her through. She did not grow thin, but *stout* and *pale*; and such a transparent palor, that, now I think of it, I wonder all who looked at her did not see that her blood was turning to water. Her sweet and lovely soul was so uncomplaining, and her smile always

so bright, that we never for a moment thought *she could* fade and die.

“She brightened up somewhat for the next month, but still did not ‘get well.’ About the last of January her limbs swelled so much, that, in haste, I rushed to the doctor. Then he said her kidneys were congested, and that Bright’s fatal disease was her malady. All that despairing love could do was done *now*. In five short weeks we laid her in Greenwood. Whatever was the form of the disease from which she suffered, I am convinced that what she did have was brought on by incessant study when she should have rested; and that it was fixed at the time that she got the severe chills, — in May, 1871.

“She was by no means a frail girl when she entered the institute. She was tall, finely formed, with a full, broad chest, and musical organs of great compass. Her bust was not flat, neither was it as full as it might have been. Her features were not too large. She had brown eyes, brown hair, a very sweet

and pleasing face. With every indication at first of strength and good constitution, she fell at last a victim to want of sense in parents and teachers, and (shall I say?) physician too."

The following observations are extracted from "The Boston Evening Transcript" of Dec. 15, 1873. The initials, "A. E. J.," over which they appeared, it is, perhaps, needless to add, are those of one whose intelligence, accomplishments, and experience as a teacher of girls, give exceptional value to her statements. She presented the result of her experience in "The Transcript" under the title of

THE EDUCATION OF WOMEN.*

"The keen interest which is felt by a large class of intelligent women in New England,

* Being a stranger to A. E. J., I have ventured to extract these observations from the Transcript without her knowledge. They confirm the teachings of physiology and the conclusions of medical experience.

in the discussion of the higher education of women, is vastly greater than has found any expression in print. Their mental condition is that of inquiry, often of dissent from what has been said, but not yet of confirmed opinion. Some facts they know; they have some strong feelings and wishes, but not light of experience sufficiently strong to enable them to assert that the true methods of higher education for women have yet been attained. Co-education — identical, or other — seems to them as yet only an experiment. They know that those men who are most interested in, and have most to do with, co-education, feel sure that this is the true method; that many earnest women, including those who have themselves been so educated, believe this to be the God-ordained way of training for both men and women. But it seems to them, that a subject which involves the future of their sex cannot be decided by experiments, conducted under peculiar circumstances, extending over scarcely thirty years of time. The decisions arrived at by those persons who

favor co-education (identical?) do not seem to them to have been made with due consideration of all the data which must have place in any fundamental discussion of this subject, fraught with such tremendous consequences for the future of woman and of the race.

“The question whether the present methods of education are adapted to the physical constitution of woman is a matter of very earnest and anxious consideration in the minds of many thoughtful teachers. And, by education, I mean both the home and school education. I have taught for more than thirty years: more than half this work has been in mixed schools, from the primary to the high school; and from year to year my conviction has grown stronger and stronger, that girls cannot endure the *continuous* study that boys thrive under; that, as Mr. Higginson said at the discussion in the Social Science meeting last spring, the stimulus under which the girl exerts all her powers is not enough to rouse the calmer, more phlegmatic nature of the boy.

“Although I cannot quote his exact words, I think I have given the substance of doctrine. How many times, when I have heard this presented as an argument for co-education, I have shrunk from the contemplation of the effect upon the health of the girls! And it is, perhaps, the word ‘stimulus’ which holds in itself, as in a nutshell, the real danger.

“It has seemed to me that the nervous anxiety to reach a certain point in a given time, the worry over class-records, the anxious desire to meet the expectation of friends, the wearing excitement of public days, the eager haste which parents and friends feel, in common with the girls themselves, to have the time of school-work over, have made a large proportion of the evils of education for young women. I have been painfully disappointed in the breaking-down of young women after leaving school, who seemed to be well at graduation, but who proved unable to bear the strain of after-work. I have thought I perceived the same nervous

strain in many of the written and spoken words of women on this as well as other subjects.

“It has seemed to me that the intensity of feeling has been so great, that it showed itself in a nervous, anxious tone of voice, so that I felt myself, by sympathy, the same friction.

“Whether I have given some of the true reasons for the more frequent nervous exhaustion of girls than boys, in the course of education, the fact remains, as far as my own experience goes. I believe that a portion of this nervous weakness in girls is owing to inheritance, something, also, to lack of proper care of children on the part of the mothers. I have not known many girls whose mothers had given them any careful instruction as to the care of their physical being. Some part of this nervous exhaustion is due, doubtless, to the bracing nature of our climate, which men feel as well as women, but to which the more delicate organization of the woman is the first to yield. Something may be attrib-

uted to bad methods of dress and living; but, after every allowance is made for all the evil resulting from these sources, I believe something of the trouble is to be charged to wrong methods of education in schools. They aggravate the evil tendencies already induced.

“I am heartily glad to learn that one college for women is recognizing the necessity of adapting the methods of woman’s education to the needs of her physical organization. Whether the adaptation is what it should be, is at present of less consequence than the recognition of the need. That is a step in the right direction.

“There are earnest, thoughtful women, teaching, who are trying to mitigate the evils of the present system of education, and to avert the bad effects upon girls, of a system fitted rather for boys, and into which girls have come as an after-thought. Each one of these women has grown into this work, has of necessity accepted a place in a system which she did not shape, and which she has

neither been able nor known how to change. She feels that education has been a great blessing to her. She wishes she had more, and desires her younger sisters to have better privileges of study. But some of these teachers have looked with dismay upon some of the results of their work. They have felt the strain of nerves, the exhaustion of body, which have come to some of their most promising pupils; and they have been anxiously inquiring how the development of mind may be secured without injury to the body; what can be done to adjust our system of instruction to the needs of girls. . . . No person can consider wisely, or shape rightly, the education of young women, who does not keep constantly in mind, as he marks out a course of study, the fact that the larger number of women are to be mothers, and, of the remainder, many are to be teachers; and that he is to aim at the development of a nobler *womanhood*.

“Again and again, as I have listened to some glowing description of the educational

disabilities under which women labor, of their inferior position resulting from unjust discriminations made by law and public opinion, my heart and judgment have said Amen ; but when some one of these speakers, being a woman, has so felt these burdens as to be tempted to exclaim, ‘Why was I born a woman, to endure all this?’ in common with many other women, I have said, ‘I thank God that I was born a woman.’ The joys, the delights, nay, even the sacrifices and sufferings of women, do in some degree compensate for these disadvantages, — for even the impossibility of going to Harvard or any other New-England college.

“I am willing to give up a college education with men, or even like theirs as to method ; indeed, I wish for a different one.

“And yet I will not admit that woman may not attain as noble and symmetrical an intellectual development as man. I believe the perfect physical and intellectual development of the woman will bring to the civilization of to-day a beneficent element not yet felt as

it should be. To woman is committed the shaping of the beginning of all education, the future of the world. If every woman who shall be a mother or teacher is so trained, beyond intellectual culture like that of men's, she is specially fitted to discharge the duties of a mother, both physical and intellectual, that whether she be the queen of a nation, or of one household, or never a queen at all, she shall 'hold her uncrowned womanhood to be the royal thing, that is the education for woman.'"

D. H. Cochran, LL.D., the distinguished head of the Brooklyn Collegiate and Polytechnic Institute, was asked by the writer to what conclusions he had been led upon the relation of sex to education, by his long experience as a teacher. In reply, he sent the following letter, with permission to publish it, as a contribution from him to the investigation of the question under consideration : —

“My convictions of the necessity of shaping our educational systems so as to meet the peculiar demands of sex are of long standing and very positive. I have experienced none of the ‘moral’ or ‘intellectual’ difficulties so called: on the contrary, I believe the direction and government in mixed schools is easier and more pleasant than in schools of either sex alone; and I have generally found the female quicker in apprehension, and more ready in the class-room, than is the male. But the physical conditions of the two sexes are so unlike, that I do not think it possible that a system of co-education, beyond the ages of puberty, can be devised, that shall have due regard to the highest interests of both. I see that I have already run away from the question you addressed to me; but the inevitable consequences of these physical differences, when once recognized, in their bearings upon our systems of education, are so persistently obtruding themselves upon the mind of a teacher, that it is hardly possible to shut them

out ; and, unfortunately, they often unfit him for a patient and candid consideration of the truth when biassed by preconceived theories of education.

“ In reply to your letter, I would say that I had fifteen years’ experience in mixed schools, where the pupils were classed and educated without distinction of sex. The last ten years of that period was in the New-York State Normal School. In that school the youngest females were sixteen years of age, and the youngest males were eighteen. The course of study, certainly, was not severe, commencing with the qualifications requisite for the lowest grade of certificate for teaching common schools in the State of New York : it continued during two years, and was supposed to furnish its graduates with the qualification for the highest or State certificate. The larger proportion of the pupils were females ; and during the war it rose to above eighty per cent of the whole number in attendance.

“ About thirty per cent of those who entered

the school completed the course of study ; and about seven per cent of the graduates failed to report themselves as teaching after leaving the school. A very large proportion of these failures were on the part of the females ; and it was accounted for very complacently, on the supposition that they had advanced from the charge of schools to the charge of families, and that their services were not lost to the State. But the number of students who were evidently unfitted for teaching by impaired health induced my predecessor in charge of the Normal School, Dr. Woolwalk, or the veteran educator, now the efficient Secretary of the Board of Regents, to make an eloquent appeal to the Commissioners in his Annual Report of 1855, to send only such students to the school as possessed a sound physical organization, equal to the work of preparation required by the Normal School, and to the discharge of the teacher's duties afterwards.

“Notwithstanding his earnest efforts, the evils of failing health on the part of our

female pupils continued, and the consequent incapacity to discharge the duties for which the State was educating them. But the facts were hardly suspected until suggested accidentally in 1866 ; and then the reports of Dr. Bailey, who had been consulted by a large number of the female pupils, and of a lady in the faculty of the school, revealed the astounding fact, that, among about one hundred and eighty female pupils then in the school, there were over twenty cases in which the periodical functions peculiar to the sex had ceased for over two months, and that there was a much larger number of similar cases less serious. Even then the causes were attributed to stairs, bad ventilation, and recklessness of health, without suspicion that the evils were inherent in a system which imposed upon the female continuous labor, and in amount equal to that of the male, who was in many and perhaps in the majority of cases her intellectual inferior, but who was the inheritor of continuously rugged health.

“ The logic of facts to which our eyes were

so slowly, and, I fear, unwillingly opened, finally led to the establishment of a more elastic course, optional to the females. But, while this gave relief to a part of the pupils, it augmented the evils to others ; for the more ambitious regarded the exemption from advanced mathematics as a reflection upon their intellectual ability, and persisted in taking the severer course in spite of the advice of their teachers.

“ This spirit was indicated in the remark of one of these pupils to a lady-teacher who was advising her to drop the mathematics of the senior year, on account of failing health. She said, ‘ I will do it, if it kills me.’ We can hardly wonder that the teacher impatiently replied, ‘ If it killed you, perhaps it would not so much matter ; but are you quite willing to impose upon your friends the burden of your lifelong helplessness ? ’

“ The only recourse was to reduce the whole course of study, and its consequent utility to our male pupils, who, without more intellectual ability, but with greater capacity for

uninterrupted labor, were able easily to accomplish what we could not safely require of both sexes together. Do not understand me as concluding against the higher education of females.

“I have observed no facts to be arrayed against its advocates. I have been compelled to the conclusion that the sexes cannot be educated together with advantage to either, and that the physical disadvantages under which she labors render it necessary that a system be devised so elastic, with so much optional work, that the female may rest, at least comparatively, as occasion requires, without her falling behind, or becoming a burden to the class or the teacher. I urge the separate higher education of females solely upon physical grounds.

“My experience has forced me to this. I have a record of my former pupils who stood high in their classes, who did their work with seeming ease, but who have been unable to teach, and now confess that they date the beginning of their present sufferings to the

continuous labor of school. I have in my mind, as I write, the case of a young lady from Tioga County, now residing in this city, who stood foremost in her class, and without apparent effort, but who has never been in sound health since her graduation; and she attributes her present condition to the insensible exhaustion of her class-work. Yet she would have been the very last to confess overwork while a pupil; and I do not think that either she or her teachers then suspected it.

“But I must close this hastily-written letter. I would that I had time to put it in better shape. If its substance renders it of service to the cause of right education, I can only say it is more than I can expect from its form.

“In conclusion, I trust the present discussion will be continued until the eyes of teachers are opened to the evils they are unconsciously inflicting upon those in their charge, and for whom they are so devotedly laboring.

Very truly yours,

Last February an article appeared in "The Brooklyn Union," under the title of "Hazard Papers, No. 7," from which the following extracts are made:—

"Not forty years ago I was appointed principal of an institution for girls not a thousand miles from Brooklyn. A charter had been obtained from the regents of the university, an appropriate building erected, and abundant chemical and physical apparatus supplied. The design of the institution was to furnish a higher grade of culture for girls than had been given in the city or country. The plan was popular; for on opening its doors more than three hundred pupils were enrolled. I saw that an opportunity was furnished of doing something for female education which had not been attempted, and felt the responsibility of my position. I had before me such educators as Emma Willard, Catharine Beecher, and others, who were pioneers in the cause of education, but felt that there was higher ground to be occupied.

I queried, Why are not young women entitled to a culture similar to that given to young men in our colleges? I will see what can be done. A liberal course of study was planned, a proper classification of pupils made, and the working machinery set in motion. I saw that time was required before any thing like flattering results could be obtained. My assistants were inexperienced; my pupils, young and undisciplined. But we went patiently to work, and, after months of thorough drilling, were able to form a senior department. The question, Can young women master the abstract sciences? pressed itself upon my attention. Classes in mathematics were formed, and patiently drilled. Essentially the same course as that at the military academy at West Point was, in two or three years, adopted, — a thorough course of pure and applied mathematics, embracing as its crowning dome the differential and integral calculus. This was regarded by some as an unjustifiable assumption, which would surely end in defeat. But, not to be daunted

or turned from our work, professors of mathematics from the colleges were invited to conduct the examinations of the classes. They came year after year, and testified as follows. Prof. Joseph Henry of the Smithsonian Institute, Washington, in 1842 said, ‘The committee were surprised and satisfied with the evidences of proficiency which had been exhibited. They were surprised and delighted with the rapidity and precision with which the exercises were conducted; and although they have frequently attended examinations of males, yet they are free to say that they have never been present at one which surpassed this in the evidence given on the part of pupils of thorough acquaintance with the subjects.’

“Prof. Albert B. Dod of Princeton College reported in 1843, ‘With scarcely an exception, the problems and theorems — which were all assigned by lot, and many of them were of the most difficult kind — were solved with the utmost facility, and accompanied with the most precise account of the several steps

and processes employed, and of the principles upon which they depended.

“ ‘As a further test of their proficiency, the principal had previously proposed to the class questions selected from works with which they had no acquaintance, and which they were required to solve in writing in the presence of the principal and of the assistant teacher of mathematics. These problems, about thirty in number, selected from the Cambridge Problems and other works, many of them difficult of solution, and wrought out under circumstances which put to the completest proof the unassisted powers of the pupil, afforded, in connection with the oral examination, a thorough test of scholarship.’

“Prof. Charles Davies, former professor of mathematics at West Point Military Academy, in 1848 said, ‘The examination was conducted without any aid drawn from the text-books; and hence each pupil was called on to answer from her knowledge of the subject, and could not avail herself of words committed to memory, or of impressions but

faintly and imperfectly made upon the mind. The examination was continued for more than five hours ; and searching and severe tests were applied. The answers, the demonstrations, and the discussion of abstract and difficult principles, all evince a high proficiency in mathematical science.'

"E. C. Ross, professor of mathematics in the Free Academy, New York, reported in 1849; 'The examination in algebra was thorough, embracing the whole range of subjects contained in the text-book. The most difficult theorems in geometry were demonstrated with a clearness of reasoning, and accuracy of expression, that would have been credible to the pupils of our highest institutions of learning.'

"Charles W. Hackley, professor of mathematics in Columbia College, wrote in 1850, 'The committee had expected an intellectual entertainment of no ordinary kind ; but their anticipations were far surpassed by the actual and vivid reality. Not satisfied with their performance on the blackboard, the neatness

and accuracy of their solutions, the committee questioned them minutely in order to ascertain the depth of their mathematical knowledge, compelling them to pass an ordeal which none could accomplish without fully understanding the subject. There could be no deception. Their manner of answering the most difficult and intricate questions gave ample evidence that they were mistresses of the science.'

"Elias Loomis, professor of mathematics in Yale College, in his report for 1855 said, 'We doubt whether there is another female seminary in the United States, where six young ladies can be found who can furnish more elegant solutions of the test-questions than have been furnished by six members of the graduating class. We believe that the mathematical studies are pursued at the institute with a thoroughness and success not surpassed by any similar institution in the country. We know, that, as regards very many of them, the institute is in this respect incomparably their superior.'

“In order to stimulate and intensify the interest of my pupils in this direction, a gold medal was offered as an object worthy of achievement. In other departments, as belles-lettres, logic, the mental, moral, and physical sciences, the same success was won. The success was brilliant. After many years of labor in that field, I left it to establish a similar institution in another city. I have recited what may appear to be too much of my own personal history ; but I have done so for the reason which will be presently given. I had reached the solution of the question in the affirmative as to the competency of woman to master the abstract sciences, and learned that girls, as a class, are quicker and better students, up to a certain age, than boys. I had previously taught the latter, and could judge. The brain-power of girls is more facile, and ready in expedients. A boy’s brain, on the contrary, is slower in development, and less responsive. This difference of ability, I think, continues up to a certain period, say twenty-five years, when the more sluggish

brain of man is aroused, and ever after is capable of greater achievements in intellectual power. This, I think, is borne out by facts coming under the observation of every experienced teacher of the two sexes. . . . I do not know how much harm I did to my own pupils; but I do know that such was sometimes the intensity of interest at the mathematical examinations, that it was occasionally necessary to allay the excitement of the throbbing brain by putting bandages of ice upon the temples of the competitors.

“Here let me say that my conviction and repentance of sin in this respect took place years ago; and I have learned to adopt a different regimen in the treatment of my pupils. I have abolished medals, public examinations, and all unnecessary excitement to the mental discipline of girls. . . .

“As an educator of more than forty years’ experience in the practical business of teaching, in which time some ten thousand pupils have come under my care, I would protest against all visionary and extravagant methods

in female education ; all large communities of girls in college establishments, for the government of which quasi military codes of law are necessary, by which much if not all that is social and domestic in education is lost to the poor girls.

“ As we look upon the increasing physical deterioration of our American girls, and reflect that they are to become the mothers of an unborn generation, on which will surely fall an inheritance of defective physical organization, and consequent mental infirmities, it is time to sound a note of alarm, and look at the causes which are undermining the Republic, and search for the remedies that should be applied. . . .

“ In conclusion, let me say that we are a people given to experiment. There is nothing in our politics, economies, or religion, that must not be put to the *experimentum crucis*. This is true of our schools for girls. . . . The cry to our older colleges and time-honored universities is, Open your doors, that the fairer part of creation may enter, and join in

the mental tilt and tournament. God save the American people from such a misfortune!"

It appeared, on inquiry, that the author of the article from which the preceding extracts are taken, was Dr. Charles E. West, principal of the Brooklyn Heights School for Young Ladies. Though personally a stranger to him, I ventured to address to him a letter similar in tenor to that which was sent to Mr. Cochran. The following is his reply:—

BROOKLYN HEIGHTS SEMINARY,
June 6, 1874.

DEAR SIR,— You ask my opinion in regard to the physical evils of our present modes of our female education.

From an experience of more than forty years in the practical business of teaching, most of which time has been spent in the education of girls, I have had abundant opportunities of observing the bearing of our American modes of school-discipline upon

the health and well-being of our young women. Within the last twenty-five years, I have witnessed an evident deterioration of physical vigor in them, which, I think, has, in part, resulted from their luxurious modes of living, — as highly-seasoned food, unseasonable hours of sleep, inadequate clothing, and insufficient exercise, — but mainly, and in connection with these deteriorating causes, from the excessive mental strain put upon them in the process of their scholastic education.

There has been developed a greater intensity of brain-power than has been consistent with the welfare of the vital forces. This more rapid maturity has been followed by a correspondingly earlier decay of physical power. This, I think, is generally true of girls living in our cities and large towns. The extreme delicacy and fragile beauty of the American girls is a subject of general remark among Europeans. They are beautiful; but theirs is not the beauty which distils in the blood of the English or German maiden. It is wanting in strength, an essen-

tial element in the highest forms of beauty as it is seen delineated in the Grecian statues of Juno and Minerva. One of the leading causes of this deterioration, as I have said, is the intemperate discipline of the maiden's school-life.

And here I need not stop to argue whether there is sex in mind as well as in body, — a truth, I think, which admits of no debate; and, if a truth, then all our theories of education which are based upon the identity of the sexes must be fallacious.

Here is the root of the evil; and, the sooner it is ascertained and extirpated, the sooner will a true theory of education for girls be adopted, and a noble success achieved.

It is absurd to educate a girl as you would a boy. You might as well undertake to train the elephant and the gazelle for a competitive foot-race. All the dexterity and tact of Barnum could neither give agility to the one, nor a ponderous gait to the other.

The great folly of the age is to treat girls

and boys, in their education, as though they were alike. The girl thinks herself abused, if she cannot attend a boys' school; or, if not attend a boys' school, if she cannot have just such a curriculum of studies as the boys have. Hence our pretentious female colleges and universities; and hence, too, the premature wrecks which leave these academic halls to sadden parental hearts.

I am using strong language; but *facts* justify the language. It is a sad truth, that the guardians to whom are intrusted the present and future interests of the human race are false to their trusts. That they sin through ignorance is the most charitable view that can be taken of their conduct. It is patent to every observing educator, that young women cannot be put into our State normal schools and academies with young men, to pursue their studies together, with any degree of safety to their health.

Another point in the discussion of our subject, I wish simply to allude to. It is this, that, as there are no two persons identi-

cally the same, so no system of education, as such, can be applied indiscriminately, and with success, to any number of pupils. Each requires a discipline adapted to his or her nature. The skill of the teacher lies in his ability to understand the temperament and peculiarities of each, and then, in his tact, to apply the regimen that shall contribute to the best development. Here lies the great art of teaching. The opposite is the system of *cramming* (a *vulgar* term, but aptly expressing a *vulgar system*), which is but too universal in our day. This indiscriminate treatment of the two sexes in the class-room is most damaging to the female. It is time that this matter should be understood. The evil has run long enough. It ought to be discussed in every convention of teachers in the land. In the view I have taken of mixed schools of the higher grade, and of those institutions that are devoted exclusively to female education, — which go under the name of colleges and universities, the professed object of which is to equal, if not rival, the

culture that is given at Harvard or Yale, — I would not be understood as underrating the education of women. On the other hand, I would advocate for her the highest possible culture ; so that she might grace any station in life to which she may be called. But it should be a culture consistent with and in harmony with her nature and office in life ; and the mode of culture should not be inconsistent with her health and well-being.

I remain truly yours,

CHAS. E. WEST.

Mr. Eben S. Stearns, principal of the Robinson Female Academy, Exeter, N.H., who has been known for more than a quarter of a century as an able, intelligent, and successful teacher of girls, and whose testimony is of corresponding value, writes,—

“ My opportunities for observation have not been those of a scientific physician, and I cannot speak with that assurance which would be required of him ; yet, as the result

of many years' experience in the education of females, I cannot resist the conviction, that, in the methods of a girl's education, careful attention should be paid to the peculiarities of her organization. As an educator, I do not recognize the least inferiority in the female sex to males of the same age and advantages.

“In patience, power of endurance, courage, mental activity, and success in the acquisition and application of knowledge, few, if any, of the other sex, can be found to surpass many of them.

“Let them, if they wish, seek the bar, the forum, the pulpit, or the healing art; let them have place as professors, as school-committees, the right of suffrage, and all else they desire; and I will wish them success.

“But, after all, I cannot resist the conviction, that most of these ends must be reached, if at all, by a different way from that over which the other sex may be safely carried; that the whole course of discipline and training must have a special adaptation to their

peculiar organization and circumstances ; and that any method of education which ignores sex will generally fail ; while a life-burden of ill-health will be entailed upon multitudes, if not upon all females, who are subject to it. Every experienced teacher of females knows that there are times when the demands of the class-room must not be too earnestly insisted upon, and when nervousness and irritation must be dealt with very leniently. In a mixed school or college, I do not see how proper allowance can be made; without, on the one hand, lowering the standard for boys, or compelling girls to submit to an iron routine, which would sooner or later crush the most of them.

“What I would insist upon is simply that woman’s education should be adapted to her peculiarities of body and mind, and should meet her own wants.

“In determining what this education shall be, I would have woman speak for herself, if she will. Let her study herself, know herself thoroughly, and then say what is

best for her, and what will make her that she desires, and is entitled to be, — the equal of man.”

Imitating, in a small way, the method pursued by the State Board of Health of Massachusetts in its recent investigation of school hygiene, I sent two or three questions, similar to those prepared by the Board, or the same, and relating to the subject before us, to three or four eminent physiologists and gynæcologists, with a request for a statement of the conclusions to which their observation and study had led them in this matter. Their replies form the third class of observations previously referred to.

Dr. William A. Hammond, professor of diseases of the mind and nervous system, in the University of the city of New York, and president of the New-York Neurological Society, whose researches in physiology, and whose study and treatment of the nervous system, have given him such a just and widespread reputation, says, —

“It falls to my lot to see a good many young ladies whose nervous systems are exhausted, and thus rendered irritable, by intense application to studies for which their minds are not suited. Only a few days ago a mother brought her daughter to me to be treated for spinal irritation, with all its accompanying nervous derangements; and I find, upon inquiry, that this girl of sixteen, who could not spell correctly, was compelled to study civil engineering and spherical trigonometry, — subjects not as likely to be of use to her as a knowledge of the language of Timbuctoo. In my opinion, schools such as the one this girl went to do more to unsex women than all the anomalies who prate about the right to vote, and to wear trousers. Now for your questions, —

“ ‘ 1st, Is one sex more liable to suffer in health from attendance in school than the other ? ’

“ Undoubtedly, every physician in a large city, who has had experience with school boys and girls, knows that the latter suffer more

frequently and severely. In country schools, where the attendance is only for a short time of the year, and for a few hours each day, and where the pupils have to walk two or more miles to get to school, the difference, though existing, would probably be not so distinctly marked.

“‘ 2d, Does the advent of puberty increase the liability, and, if so, more in one sex than the other?’

“Puberty being a much more complex process in girls than in boys, the former are more liable to disease at this time; and this liability is increased by whatever tends still more to exhaust the nervous system, such as mental application or anxiety.

“I have repeatedly seen cases in which the flow of the menses had been suddenly stopped by the anxiety induced by the necessity of learning a school-lesson.

“‘ 3d, In the education of girls, should any attention be paid to the catamenial week?’

“The utmost possible care. People who are very careful to avoid draughts of cold air

when they are overheated, pay no attention whatever to their daughters at a time when the system is peculiarly liable to disease. I have known of cases in which girls menstruating, and wishing to go to balls, have been instructed by their mothers to stop the function by putting their feet in ice-cold water; and in two of these cases epileptic convulsions were the result. A large number of the cases of epilepsy in women which come under my care are directly the result of menstrual disturbances, due to inattention and imprudence.

“ ‘ 4, Is the nervous system any more liable to suffer from excessive study at puberty, or during the catamenial week, than other parts of the organism ? ’ ”

“ Yes. My experience is decidedly to this conclusion, and the results are hysteria, spinal irritation, chorea, epilepsy, catalepsy, neuralgia, wry-neck (*torticollis*), cerebral congestion, cerebral anæmia, nervous exhaustion, and, occasionally, acute inflammation of the membranes of the brain.

“ WILLIAM A. HAMMOND.”

Dr. D. M. Da Costa of Philadelphia, whose professional acquirements, opportunities for observation, and sound judgment, are recognized throughout the country, as well as in the city of his residence, answers the questions originally proposed by the State Board of Health of Massachusetts, as follows:—

“MY DEAR SIR,— The questions you propound I will answer as far as in a brief way it is possible to do.

“As regards one sex being more liable to suffer in health from attendance on school than the other, my experience gives but one reply. With any thing like equal work, the female sex suffers much more; and I think the liability to deterioration of health, and to many disorders of the nervous system, far greater in girls at the age of puberty than in boys. I believe that excitement of any kind, and premature dissipation, may come in for a share of the injured physical condition that is attributed to excessive study; but, that this is most injurious, I have had opportunities of witnessing.

“As regards the injurious effects of over-work during the catamenial week, or in how far regard should be paid to this period in the education of girls, I have not studied the matter closely enough to express, from positive observation, a decided opinion; but common-sense, and the teachings of physiology, point in the direction of lessening, as far as practicable, work at a time when the whole system is depressed; and, as regards the effect of mental strain, it may not be uninteresting to you to know that I saw, some years since, a violent case of delirium, lasting several days, produced in an ambitious school-girl busily preparing for examination. I am sure good will come from the discussion of this subject; for there is certainly no question more important than how modes of culture and mental occupation, and new fields of activity and usefulness, may be afforded women, without sacrificing their strength, and their full powers to become wives and mothers.

Sincerely yours,

D. M. DA COSTA.”

Some time last winter a teacher wrote to Dr. T. Addis Emmet of New York for his opinion upon the comparative ability of boys and girls to follow the same methods of education, or the relation of sex to education. Unsolicited, Dr. Emmet sent me his reply, and enhanced the favor of sending it by permitting its publication. His long and large observation of the diseases of women, for the treatment of which he has acquired such a deserved reputation both in this country and Europe, give exceptional value and weight to his conclusions upon the matter we are discussing. He says, —

“I have long been impressed with the fact that the system is a wrong one in attempting to educate both male and female on the same plan, as their organizations are so different. The nervous system of a young girl, on reaching puberty, is as susceptible of external influences, as the barometer, of atmospheric changes. The health and happiness of her whole after-life will turn upon a proper

management of this period, and until her system has accommodated itself to the change. A boy, at this age, should be held well up to the mark to keep him out of mischief; and sufficient out-door exercise will act as a safety-valve to keep him in good health. As society is now constituted, the female is the sufferer, by an inheritance of a weakened organization.

“The sexes are thrown too much together in early life; and frequently puberty is forced before the body has been sufficiently developed. To early and artificial excitement, to a taste for dress, and a neglect of nearly every habit of life, may we attribute much of the bad health of our young women. With an impaired organization, which has become hereditary in our day, the system of education for young women which is so generally pursued is a most vicious one. We find it pushed at a time of life when rest and quiet should be the rule, when all the life-forces are needed to accommodate the system to the shock, as it were, of so radical a change.

Without the female is unusually robust at puberty, it is impossible to develop the brain, by close application to study, except it be at the expense of an arrest of development in the uterus and ovaries.

“I do not advocate a life of indolence at this time, but deprecate the forcing system. For some little time before puberty is expected, and for a year, at least, after it has been properly established, there should be a relaxation from study. This is particularly true in regard to the effect of music with many girls, where the nervous element is prominently developed. At the time of menstruation, absolute rest should be enforced, both of body and mind, until the proper time of return, and quantity of flow, has become a fixed habit.

“In the interval, attention should be paid to a proper regulation of every habit of life, chiefly as regards the condition of the bowels, and the proper amount of exercise in the open air. If this course has been properly followed, it would be far better to go into

society a few years later, and devote the same time of life to hard study, which the young men pass at college.

“As a rule, our girls enter society too young, and many before they have reached their growth, or full physical development. Few are able to nurse their children, the needed stimulus for the uterus to regain its natural size: as a consequence, some local disease becomes established, which is likely to continue until menstruation ceases at the change of life.

“This condition may not cause sterility, but is likely to lessen the number of children, and to transmit an enfeebled constitution. It is not Nature’s law, that such should be the case; but society has perverted Nature, and we have to deal with the consequences.”

Dr. Fordyce Barker, the eminent professor of obstetrics and diseases of women in the Bellevue Hospital Medical College, New York, permits the statement that he has been led by his personal observation and

experience to the same conclusions as to the relation of the epoch of female development to education. While preparing these pages for the press, the writer received a letter from Dr. Lionel S. Beale of London,—a physician whose physiological researches have placed him in the front rank of modern investigators, and made him an authority wherever physiological science is taught or valued,—in which the following paragraph occurs. The extract appears in this place with his permission, and closes, not inappropriately, this section of a brief contribution, probably the last which the author will make, to the discussion of the relation of sex to education,—a matter of vital importance alike to the individual, the nation, and the race.

“Knowing,” says Dr. Beale, “as we all do, how very different are the organs of boys and girls, and what different nutritive and other changes are proceeding in the two sexes between the ages of fifteen and twenty,

we cannot but be surprised that the same training should be advocated for both. But physiology and common-sense are utterly disregarded by many of the 'leaders of thought.' However, we may feel sure it will all come right in the end; for '*Naturam expellas furca, tamen usque recurret*' still holds: but how many poor creatures may be experimented upon and ruined in health before leaders in thought shall be convinced, one dreads to think."

A GLIMPSE AT ENGLISH BRAIN-
BUILDING.

PART III.

A GLIMPSE AT ENGLISH BRAIN-BUILDING.

"Of all the intellectual errors of which men have been guilty, perhaps none is more false, and has been more mischievous in its consequences, than the theologico-metaphysical doctrine which inculcated contempt of the body as the temple of Satan, the prison-house of the spirit, from which the highest aspiration of mind was to get free. It is a foolish and fruitless labor to attempt to divorce, or put asunder, mind and body, which Nature has joined together in essential unity ; and the right culture of the body is not less a duty than — is, indeed, essential to — the right culture of the mind." — HENRY MAUDSLEY, M.D.

"Man is the nobler growth our realms supply;
And souls are ripened in our northern sky."

MRS. BARBAULD.

FROM a careful observer who has been in England, and who found time in the midst of pressing avocations to visit some of the English schools, and to make a few notes of his observations upon them, I have obtained the following glimpse of English school-

methods for girls, or of English female brain-building, which may be new to some on this side of the Atlantic.

While he was in England, he made various inquiries and observations touching the methods of English schools for girls who belong to families in good circumstances; and, in general, he tried to see wherein English ideas of bringing up girls are different from our ideas. The interest of this inquiry lies in the indisputable fact, that the educated English girl of twenty is, on the average, a finer creature physically than her American contemporary: she is larger-boned, more muscular, fuller-blooded, and, in general, more robust, and better able to bear the burdens of womanhood. I can best give the results of his observations under several distinct heads:—

DIET.—The children's food in a good English home or school is, on the whole, simpler, more digestible, and more nourishing, than in most good American homes and schools; but the main difference is not in

the food, but in the general sentiment with regard to eating. To eat regularly at least three hearty meals every day is a serious duty as well as pleasure in an English family or school; and there is generally some fourth eating of a lighter description. That a daughter should go to school, or begin her daily work, without having eaten a stout breakfast, would be a monstrous horror in an English family: with us it is an occurrence too common to excite a remark either at home or at school. In a large day-school for girls in London, in which the session was only four hours and a half long, it was found that every girl was required to eat luncheon in the middle of the morning. Girls who did not bring luncheon from home were required to buy it at the school. The same thing was observed at a school for twelve hundred girls in Edinburgh. Is there a day-school in the United States in which a similar regulation is enforced? An extreme care to supply at regular times an abundance of simple and wholesome food characterizes English bring-

ing-up of children in the upper classes, whether at home or at school. It is too often grievously neglected with us.

FRESH AIR. — English girls are more in the open air than American girls ; and when they are indoors they live in rooms warmed almost exclusively by open fires. The climate of England befriends them here. Winter and summer, there is a part of almost every day in England when it is pleasant, or at least not unpleasant, to be in the open air ; and, during their winter weather, there are but few days when open fires fail to keep the rooms of a well-built house moderately warm. The English do not wish to be as warm in their houses as we do. The general English belief in the virtue of fresh air and out-of-door exercise affects very much the management of schools, whether for girls or boys. At the English public schools for boys, more attention seems sometimes to be given to physical than to mental training. What would American teachers think of having a recess of ten minutes out of every hour,

during which every child should be obliged to go into the open air, and the windows of every room in the school-building should be thrown wide open ! Such was found to be the rule at an excellent Scotch academy which receives both boys and girls. The girls at that academy were so constantly going into the open air, that they wore their hats even when in the school-rooms. The development of a taste for exercise in the open air, and of a love of out-of-door occupations and sports, is slow in this country. The extremes of our climate are against us. We build our houses to keep out heat and cold, not to enable us to enjoy such temperate weather as we really have. The newness of the country is also against us. The mere absence of well-made roads is a serious difficulty. For sitting in the open air, and for walking, riding, driving, boating, yachting, carriage-journeys, and indeed every sort of open-air exercise and amusement suitable for the sex, the English girl of the upper classes has a much better chance than the American girl,

and she has by inheritance and training a stronger taste and greater capacity for such healthful occupations than the American. No reform in our methods of bringing up girls will be effectual, which does not include much greater attention than we now give to securing for them fresh air indoors, at school and at home, and moderate exercise out of doors and open-air amusements.

SLEEP. — The usual bed-time at English boarding-schools for girls is nine o'clock, even for girls seventeen and eighteen years old. Moreover, at many of the best of these schools, the girls are not allowed to study after eight o'clock in the evening, in order that the mind may be at rest during the hour before bedtime. Even the masters and mistresses of day-schools are expected to take vigilant care that their pupils do not overwork themselves at home. A schedule showing the precise time [e.g., from three to half-past four, or from seven to eight] to be spent each day in the preparation of home-lessons is, at many schools, given to each pupil ; and her

parents are informed, that, if the pupil cannot complete her lessons within the time mentioned, she should leave them undone. In preparing these schedules, the master or mistress has to inquire systematically into the habits and hours of the families from which their pupils come, and to adapt the schedule of each pupil to her home-circumstances. So far as I know, such care of the pupils' homework as this is very rare in American schools, whether for boys or girls.

TRANQUILLITY OF LIFE. — An English girl of good family grows up, until she is eighteen years old, in an atmosphere of profound quiet, like a plant which the gardener has sheltered from the wind, that it may develop on all sides to perfection. She does not associate much with her parents and their friends ; sees very little of young men beyond those of her own family ; does not go to parties, or public entertainments of any sort ; and knows little, and cares less, about what is going on in the world. In all these respects, her life is physically much more wholesome

than that of her American sister. Moreover, she is never subjected to the influence of strenuous competition at school, — that most disastrous influence for girls and young women. She is never a performer at school 'exhibitions,' or public examinations of any kind. Her tasks at school, or with her governess, are decidedly lighter than those of boys or young men of the same age; and she never has occasion to compare her attainments with those of the other sex.

THE INFLUENCE OF THE DESIRE OF MARRIAGE. — A fortunate marriage is what an English girl desires for herself, and what her parents desire for her. To this end it is all-important, in England, that a young woman, of whatever class in society, should be healthy and vigorous. When American young men feel about this matter as English young men feel, and have felt for many generations, there will be a great improvement in the physique of American women, because parents will have strong motives, perhaps unconscious ones, for using all means to that good end; and it

is an end which can be accomplished by the persevering use of the right means. Thoughtless marriages are more natural in a new society than in an old. As American society gets more highly organized, such marriages will be less and less common.

English education and English society are not without their faults; but this glimpse at their educational methods gives us a hint of possible improvements in ours. The English educate the body better than we do, and *so far* build better brains. There is no reason why we should not equal or surpass them in this respect as well as in others. A republic should build the brains of its children with as much care and excellence as a monarchy performs the same task, if it would exist as long.

